How Governments Can Build Resilience in a New Normal

Emerging Practices from Europe,
Middle East, and Africa
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Introduction

The COVID-19 pandemic has demonstrated that public sector organizations need the proper infrastructure, capabilities, and controls to overcome disruptions caused by global health outbreaks and the associated lockdown measures. Organizations that embraced cloud services proved more responsive. They were able to continue operating remotely and serving their customers, demonstrating agility, scalability, and speed.

Powering this transition is cloud technology and a remote-first mindset. For years, the cloud has enabled enterprises and public sector organizations to access a wide range of services on demand—from data storage to machine learning and artificial intelligence. The cloud's scalable, secure, and low-cost infrastructure helps organizations modernize and innovate, obtain insights to make better decisions, and instantly connect to the public. The cloud's elasticity enables organizations to scale services up and down as needed, optimizing the use of resources, which helps governments save cost.

A few days after the global lockdown, it became clear that organizations that had adopted cloud services were well positioned to overcome the challenges of working remotely. They could simply access hundreds of services, rapidly scale to accommodate spikes in demand, and create new technologies to respond to emerging customer needs. For example, in the UK, AWS partner VoiceFoundry is using AWS to help local government manage increased call volumes due to COVID-19. Two London councils, the London Borough of Hounslow and the London Borough of Waltham Forest, built a virtual contact center to respond to inquiries from the public while ensuring staff safety by enabling them to work remotely. London Borough of Waltham Forest now handles calls from more than 3,000 residents and customers a day, while London Borough of Hounslow's Community Support Hub helps the most at-risk and vulnerable residents in the community receive up-to-date information, food, and essential supplies. The Hub has made and received thousands of calls to date, a number that is continuing to increase each week.

Scale, speed, and security were particularly important as demand for services became virtual. In Italy, AWS and education technology (EdTech) company bSmart labs scaled virtual classrooms to a third of the country's schools within the span of one week. The World Health Organization is using AWS to build large-scale data lakes, aggregate epidemiological country data, and assist global healthcare workers in better treating patients. We saw governments use open source services to address mission-critical community needs. Governments in the UK, Australia, and Canada are but a few that have built open source solutions to facilitate information sharing.[i] To accelerate the combined global response to COVID-19, AWS gathered examples of third-party open code, tools, and standards and launched **Open Government Solutions** for anyone in the public sector to use immediately.

Governments have responded with stimulus packages to restart their economies, strengthen healthcare systems and online learning programs, and reskill workers for available jobs. The challenges are daunting: the IMF expects global GDP to shrink by three percent[ii], and the European Commission predicts a 7.5 percent decline in EU GDP. [iii]A 2021 virus resurgence could have even more severe consequences on the global economy. Governments must now design policy responses with a view to continuing to save lives and minimizing economic loss—doing so with more constrained budgets and on faster timescales. In this "new normal," government's resilience—its ability to adapt and respond—will be critical as the public expects them to manage future outbreaks more effectively.

This paper provides a set of emerging practices for governments to consider as they restart their economies, reskill their workforce, and strengthen their healthcare systems. It offers emerging practices based on solutions that governments have successfully employed to respond to COVID-19 and deliver to millions of their constituents around the world.

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Examples of how AWS is working with public sector organizations

1 Egypt

In Egypt, keen to ensure that the 25 million K-12 students could continue to receive education, the Ministry of Education worked with AWS Partner CDSM Thingi to provide remote access to the Egyptian Knowledge Bank site.

2 UAE

In the United Arab Emirates, our partner Aleph Education quickly expanded free access to their learning platforms to 80,000 students, and they expect it to scale. Thanks to this initiative, students can now learn language, gamified math, and science, from their homes.

3 Jordan

Through a multi-faceted collaboration led by Mawdoo3 the largest Arabic-language platform in the world, the Darsak.gov.jo e-learning platform was built in just one week to help provide remote education to Jordanian students. Since it went live on 22 March, darsak.gov.jo has seen more than 35 million views of classes.

4 Italy

As Italy went on national quarantine, AW worked with bSmart Labs to provide students access to virtual classrooms using audio and video-calling services. Thanks to this new service, 30% of schools in Italy are now conducting their classes online.

5 France

Padok, an AWS Partner, together with AWS, supported French public bank for investment Bpifrance to set up a platform for SMEs to apply for financial assistance. Bpifrance normally receives 12,000 credit requests per year via online banking. From mid-March, it was able to process 75,000 requests in just three weeks, with peaks at 8,000 requests daily.

6 Spain

The Spanish government is working with AWS and its Authorized Training Partner Global Knowledge to deliver certified cloud architecture and developer courses to 150 unemployed individuals. Global Knowledge delivers the training virtually, in Spanish, and includes online testing. Upon successful completion of the course, graduates earn the AWS Certified Cloud Practitioner certificate, opening up opportunities to the growing cloud ecosystem in Spain.

7 Germany

In Germany, AWS Partner, T-Systems, helped set up a new, scalable operating platforms to handle the anticipated increase in demand for unemployment services.

Making healthcare systems more resilient

The COVID-19 pandemic demonstrated the fundamental importance of a strong healthcare system for all countries. This is critical to the return of economic activity and improving government resilience in the case of a resurgence of COVID-19 cases or another future outbreak.

COVID-19 presented three main challenges for primary care physicians globally: first, how to manage a significantly increased volume of patients seeking advice on managing COVID-19; second, how to provide non-COVID-19 related care for patients without risking exposing them to infection; and third, how to avoid infection themselves. In response, a number of governments have increased their use of telehealth, established virtual call centers, and made use of the data and analytical tools available to understand more about the spread of the virus.

Case Study: Medical imaging analysis in Italy

In Italy, radiologists are using Exprivia II, a cloud-based radiological information system, to share their results and observations after they conduct X-rays and CR scans of COVID-19 positive patients. This solution, developed for the SIRM (The Italian Society of Medical Radiology), tracks the advancement of the illness and allows doctors to forecast how many days it will take for COVID-19 to evolve using machine learning (ML) applied to medical imaging.

Learn more

Using telehealth for remote consultations

Scalable telehealth applications proved to be beneficial to patients during the COVID-19 pandemic. Babylon Health, which runs on AWS, provides teleconsultations and uses artificial intelligence to assess known symptoms and risk factors and provide real-time medical information to patients. Another telemedicine company, Exprivia, tele-monitors confined COVID-19 positive patients who quarantine at home. Another AWS Partner, QDoctor, provides a video consultation service to general practitioners, hospitals, and patients. It provides the doctor on duty with a managed workflow and access to patient records to help during the consultation. Services like these—powered by cloud technology—can respond rapidly when demand starts to rise without needing to worry about the underlying IT infrastructure.

To deploy telehealth successfully, health systems need, first, to share data and conduct confidential patient interactions virtually in an interoperable way, such as using electronic networks and infrastructure to transfer prescriptions from general practitioners to pharmacists. In April 2020, the European Commission took a step closer to data interoperability when it adopted a recommendation on a European Electronic Health Record exchange format, acknowledging the benefit to citizens, medical professionals and public administrators from having secure, controlled access to health data wherever it is required. [iv]Globally, healthcare organizations adopted the Fast Healthcare Interoperability Resource (FHIR) standard as the benchmark for interoperability of healthcare platforms. Requiring the electronic transfer of data to FHIR standards is one method for making sure providers and patients can use telehealth applications.

The second factor in successfully deploying telehealth is having a reimbursement model. Some countries, including France, Germany, and the Netherlands, have reimbursement mechanisms for telehealth. Others have reached agreement on reimbursement models for individual telehealth providers, which includes the UK, Italy, and Spain. However, few countries have a unifying model of reimbursement that complements more traditional, in-person services. Governments seeking to promote telehealth should clarify the mechanism for reimbursing telemedicine—whether it will be the same as a face-to-face appointment or not—so that providers and insurers or commissioners understand how to scale their services. Cloud technology supports flexible scaling, including at very short notice to respond to peaks in demand.

Providing scalable health advice using virtual chatbots

Patients around the world are looking to their healthcare providers for guidance on the novel virus. As a result, health systems have become overburdened with calls and were challenged to communicate accurate information and direct the public to the appropriate education and care, all at scale.

To help address this spike in demand for information, many healthcare organizations have implemented tools or technologies, such as triage chatbots, meaning a technology that simulates and processes human conversation and virtual call centers, to help scale the education and engagement with the general population who may have symptoms. These tools collect information from patients and help route them to the most appropriate level of care based on their answers. Prior to the COVID-19 pandemic, the NHS Business Services Authority (BSA) in the UK used a virtual call center to manage enquiries about the European Health Insurance Card scheme. They saw the power that providing this at scale could bring. In less than one week after implementation, the NHSBSA were able to expand their call center operations beyond business hours to answer calls 24/7 thanks to the efficiency of the call center. This provided a better experience to citizens with enquiries and showed improvements in employee retention and satisfaction too.

When designing a virtual call center, it is important to understand the patient flow and where the risk sits within the system. For example, heath systems may wish to put in place a human-operated front-end which checks whether the patient is in an emergency or life-threatening situation before routing them to a chatbot. Any pathways using a chatbot should go through full clinical validation before the organization implements it. AWS can support by advising on how peers used similar applications in the past and can provide

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comprehensive analytical tools to assess the impact of the call center on citizen behavior.

Using data and analytics for insights

Health systems around the world used cloud technology to process large datasets from multiple sources and visualise the results for different levels of decision makers. At a global level, the World Health Organization leveraged the AWS Cloud to build large-scale data lakes and aggregate epidemiological country data to track the spread of the virus. In England, AWS is helping provide the infrastructure and technology to enable NHSX – a joint unit between the Department of Health and Social Care, NHS England and NHS Improvement - to quickly and securely launch a Covid-19 response platform for critical public services. AWS is providing the underlying infrastructure technology to enable NHS to aggregate information from across the NHS and other partner organisations. NHSX are leading this project to provide more accurate visibility on factors including visibility into hospital occupancy levels, emergency room capacity, and patient wait times to inform and coordinate a national response to Covid-19. This information enhances understanding of how the coronavirus is spreading, when and where the healthcare system will face most strain, and which interventions are proving more effective than others in helping to mitigate the crisis - helping the NHS to decide where best to allocate resources.

In Spain and Germany, AWS partner STAT-UP developed a simulation and scenario planning tool called the STAT-UP CoronaCare Dashboard (SUCC-D), using AWS, to help hospitals assess their resource needs during the COVID-19 crisis. Hospitals could access the platform for free and use it to plan for additional resource requirements such as beds, intensive care equipment, and personnel. The aim is to create a sustainable tool for regional demand planning for government and local institutions, both during and after the pandemic.

Case Study:
Virtual call centres in the UK

"In the UK, VoiceFoundry, part of the AWS Partner Network, is using AWS to help local government manage increased call volumes from local residents during the COVID-19 pandemic. Two London councils, the London Borough of Hounslow and the London Borough of Waltham Forest, are using a virtual contact centre – to allow them to operate a full seven-day-a-week service, and to ensure staff safety by enabling them to work remotely. In a matter of days, the center facilitated calls from more than 3,000 residents a day, while London Borough of Hounslow has launched a Community Support Hub to help the most at-risk and vulnerable residents in the community to receive up-to-date information, food, and essential supplies during the pandemic. The Hub has made and received thousands of calls to date, a number that is continuing to increase each week."
Learn more

More and more health systems are using cloud to perform population health analytics and make decisions about health policies, priorities, and individual care plans. To support this, governments could develop a policy that enables the secondary processing of healthcare data for research and analysis purposes, allowing data to inform research studies and national population level analyses, while also respecting citizens' fundamental rights and complying with local data privacy requirements, such as the General Data Protection Regulation (GDPR). Once this dataset is available, governments and customers can use cloud technology's storage, compute, and processing services to analyse it and generate new insights, leading to more efficient and effective operational processes and treatments.

To learn more about the use cases referenced in this section:
Supporting healthcare with technology in response to COVID-19 Check the **AWS Industries blog** for more healthcare updates.

Restarting the economy: small businesses and startups

The global lockdown has had a devastating impact on small and medium-sized enterprises (SMEs), which are particularly vulnerable to shocks and loss of revenue. SMEs are the cornerstone of economies in Europe, providing two-thirds of private sector jobs in Europe and constituting 90 percent of all businesses in the Middle East and Africa. SMEs in Italy, France, and Spain reported the largest deterioration in profits and turnover since 2014,[v] and in the UK, seven in ten small firms say they have lost over half their revenue after the COVID-19 crisis. [vi]

Governments have responded with stimulus packages aimed at injecting SMEs with liquidity, offering benefits and wage subsidies and cutting job losses. The sudden flurry of government activities necessitated the rapid setup of platforms to help manage those programs—administering grants, assessing benefit eligibility, scaling up unemployment services, and providing the public with information about those programs.

Case Study: Managing fund distribution in France

Bpifrance, the French public bank for investment, has been mandated by the government to manage the distribution of State Guaranteed Loans for small to medium-sized businesses (SMEs) in France during the pandemic. Padok, an AWS Partner, together with AWS, supported Bpifrance to set up a platform in just five days for SMEs to apply for financial assistance. Bpifrance normally receives 12,000 credit requests per year via online banking. Since mid-March, it was able to process 75,000 requests in just three weeks, with peaks at 8,000 requests daily.

AWS and its partners stepped in to provide governments with the technology to meet those needs. Bpifrance, the French public bank for investment, has been mandated by the government to manage the distribution of State Guaranteed Loans for small to medium-sized businesses (SMEs) in France during the pandemic. Padok, an AWS Partner, together with AWS, supported Bpifrance to set up a platform in just five days for SMEs to apply for financial assistance. Bpifrance normally receives 12,000 credit requests per year via online banking. Since mid-March, it was able to process 75,000 requests in just three weeks, with peaks at 8,000 requests daily.

AWS is also helping governments establish instant, scalable call centers and websites to field requests from newly unemployed citizens and provide guidance on applying for jobs.

In Germany, the authorities wanted to quickly get funds out to businesses. AWS Partner, T-Systems, helped them set up **a** new, scalable operating platforms to handle the anticipated increase in demand. On the first day, 7,000 simultaneous users accessed the service. A few days later, that number reached five-digit numbers, and it is still on the rise. The cloud infrastructure increases security and elasticity of those platforms, meaning that the programs will be as simple to phase out as they were to launch, as demand starts decreasing.

Modernizing incentives for small businesses and opening up public procurement

Governments typically incentivize businesses to invest in technology by providing reliefs against capital expenditure. In the UK, small businesses can deduct from their tax liability the cost of certain purchases up to the Annual Investment Allowance (AIA). Currently, SMEs can only claim the AIA for capital expenses, which limits the ability of small businesses to spend on cloud technologies that enable technology consumption on a pay-as-you-go basis. Governments should reexamine the investment relief they provide through tax systems and explore ways to reform the AIA to incentivize small businesses to adopt the tools they need to operate in the new economy.

Opening up public procurement to more small businesses is one of the most powerful levers that governments have at their disposal to support existing and new businesses. In 2012, the UK government introduced the first G-Cloud framework, which made it simpler for public sector customers to purchase technology solutions from a broader range of suppliers through a centralized digital marketplace. Forty percent of suppliers listed are SMEs and £8.2 billion has been spent through the platform since 2012, with £3.3 billion going directly to small businesses.

The emergence of small businesses working with the UK Government, or GovTechs, to improve public services has created a new digital economy, estimated to be worth $400 billion globally.[vii] In order to counter potential impact on this important sector, governments should continue to think of policies that incentivize entrepreneurs and empower to build businesses that can scale while staying lean and agile—something they can accomplish
with the cloud.

Reskilling the workforce

The International Labor Organization estimates that the global lockdown has affected 2.7 billion workers, representing around 81 percent of the world's workforce.[viii] In Europe, unemployment could double to nearly 60 million jobs in the coming months, returning to 2019 levels in Q4 2021 in a best-case scenario. The hardest hit sectors are retail, accommodation and food services, and manufacturing.[ix]

Even as the unemployment numbers increase, the COVID-19 pandemic has created new opportunities in government, pharmaceuticals, healthcare, and logistics. [x] Demand for jobs in cloud computing also continues to grow. According to the Global Knowledge 2019 IT Skills and Salary Report, 77 percent of IT decision makers in Europe, the Middle East, and Africa report a skills gap in cloud computing, cybersecurity, DevOps, and systems and solutions architects, among other specialized IT fields.[xi] Employers attribute this to the rate of technological change and under investment in professional development for workers. This shortage is acute across the EU's public sector: 8.6 million people are expected to lack digital and tech skills by 2023.[xii]

AWS is collaborating with governments to help retrain the workforce for in-demand jobs, offering people with varying educational backgrounds the skilling they need for open jobs. AWS is working with governments in Europe and the Middle East to reskill unemployed workers and prepare them for cloud jobs.

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>
> 2019 Global knowledge 2019
> IT Skills and Salary Report

AWS is working with the Spanish government to train to reskill unemployed workers in Zaragoza. Technology cluster IDiA, which manages government grants for experimental training initiatives, worked with AWS Authorized Training Partner, Global Knowledge ES, to deliver certified cloud architecture and developer courses, to 125 unemployed individuals with STEM background or experience. IDiA plans to scale this program to other European countries after the completion of the pilot.

This is of two workforce development initiatives recently launched in Spain. In December 2019, the Spanish Foundation for Training (Fundae) built and incorporated more than 70 AWS courses on government platform Digitalizate, which offers digital training. The project was recognized by the European Center for Development and Vocational Training as a best practice, because of their successful collaboration with technology companies, broad awareness campaign and efficiency in reaching both employed and unemployed individuals interested in digital learning and advanced digital skills.

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Case Study:
Reskilling workers in Spain

The Spanish government is working with AWS and its Authorized Training Partner Global Knowledge to deliver certified cloud architecture and developer courses to 150 unemployed individuals. Global Knowledge delivers the training virtually, in Spanish, and includes online testing. Upon successful completion of the course, graduates earn the AWS Certified Cloud Practitioner certificate, opening up opportunities to the growing cloud ecosystem in Spain.

Governments are also using the cloud to analyze data and understand labor market shifts. Germany created a national labor market to optimize access from job seekers to jobs. Job seekers can search a national database of open roles to find suitable jobs. Singapore took this concept one step further with SkillsFuture, an adult learning program that allows citizens to reskill into new jobs that are in recognized demand in the job market. With mass unemployment, such national schemes to optimize jobs and reskill will shorten the duration of unemployment and consequently the depth of the recession.

Remote learning

COVID-19 demonstrated that the cloud can help educators reach millions of students online within the span of a few days. UNESCO estimates that the lockdown affected 1.5 billion students in 191 countries, as were more than 200 million higher education students.[xiii] Education leaders believe remote education is now here to stay, not only for health and safety purposes but also because it is allowing educators to innovate at a faster rate than any time in history.

Modeling projections after Phil Hill's Four Phases of Higher Ed Response to COVID-19[xiv], the first phase of the crisis saw closures of education institutions and a rush to scale online learning. AWS equipped education customers to scale online content and resources, run virtual classrooms and labs, and collaborate. In Egypt, for example, AWS worked with the Ministry of Education and EdTech CDSM Thinqi to provide 22 million students with access to the Egyptian Knowledge Bank site. The site received 7.3 million page views in just five hours after going live and had more than 574,000 concurrent users actively engaging in digital learning. In the United Arab Emirates, Alef Education is offering complimentary access to all of its learning platforms (Alef, Curio, and Abjadiyat) to keep students engaged.

Ensuring equitable access to education

In the second phase, educators shifted from emergency response to enhancing the online learning experience and addressing significant inequalities exacerbated by the closures, including lack of broadband connectivity, limited devices, poor or no study space in the home, and supporting students with disabilities. As they plan for the coming phase, educational leaders will focus on better tracking and online assessment, teacher training, and setting up (telephone) hotlines supporting student wellbeing. They are also looking to expand connectivity to provide access education or online content for all learners.

According to one estimate, less than 25 percent of low-income countries currently provide any type of remote learning, and only 36 percent of residents of lower-middle income countries have access to the internet. Solutions to the connectivity challenge are starting to emerge and the cloud can help scale those solutions to underserved communities around the world. US-based technology company Kajeet Inc, which runs on AWS, is providing learners with hotspot devices that are simple to use and are compliant with federal laws protecting student's access to online content. Already, a school district in Virginia, US, has started taking Kajeet's Education Broadband™ to those communities – they are installing the technology on buses that deployed in areas with no connectivity. [xv] The wireless signal can reach homes within 100 meters of the parked bus or the size of a football field. This is one example of a cloud solution that can help bridge the educational gap, which will be increasingly important as more schools decide to extend online learning in the coming months.

Case Study:
Jordan develops E-learning platform for 2 million students with AWS

Through a multi-faceted collaboration led by Mawdoo3.com, the largest Arabic-language platform in the world, the Darsak.gov.jo e-learning platform was built in just one week to help provide remote education to Jordanian students. Since it went live on 22 March, darsak.gov.jo has seen more than 35 million views of classes. Read more here.

Supporting staff and teachers

AWS is offering student services remotely via IT helpdesks and call centers to answer inquiries from students and parents. In one hour, AWS helped the Los Angeles California Unified School District build a call center to field questions from over 700,000 students and parents. The district ensured worker safety as staff could take calls from home.

Cloud-enabled education technology (EdTech) companies are also providing teachers with content and resources to succeed in this new teaching environment. According to India-based EdTech Impartus, 88 percent of teachers in India had never taught an online class before the COVID-19 lockdown. To remedy this problem, CareerLauncher is working with the government in Delhi to help train teachers on effective virtual teaching techniques and technologies. In addition, AWS Educate, Amazon's global initiative to provide students and educators with the resources needed to accelerate cloud-related learning, launched the Educator Mobilization Initiative, an effort to have teachers experienced in online education train their peers through a webinar series.

Educators are witnessing what one education expert, Rose Luckin, has called "the biggest education experiment ever undertaken. [xvi]" Education leaders have an opportunity to leverage new technologies to modernize education, extend online education to millions of students across geographies; use data analytics to better understand and enhance student outcomes; and work with tech partners to extend connectivity to students in underserved communities.

To learn more about these use cases:
Empowering Education with Infrastructure for Remote Learning and Work and browse our **Education Partner Solutions.**

The road ahead

In a recent brief, the United Nations Department of Economic and Social Affairs advised policymakers to "seize the COVID-19 crisis as an opportunity to establish tailor-made digital government tools, strategies, and collaborations for the future.[xvii]" In order to seize this opportunity, government leaders may consider the following recommendations to help them in their journey towards digitizing their services and offering better public services:

To strengthen their healthcare systems,

1. Governments seeking to promote telehealth may consider clarifying the mechanism for reimbursing telemedicine.
2. Governments can use the cloud to perform population health analytics and make decisions about health policies, priorities, and individual care plans. They can develop a policy that enables the secondary processing of healthcare data for research and analysis purposes, allowing data to inform research studies and national population level analyses, while complying with local data privacy requirements.

To restart their economies and minimize job loss, governments may:

3. Consider policies that incentivize entrepreneurs and empower to build businesses that can scale while staying lean and agile
4. Reexamine the investment relief governments provide through tax systems and explore ways to reform the AIA to incentivize small businesses to adopt the tools they need to operate in the new economy.
5. With mass unemployment, government's national schemes can help optimize jobs and reskilling may shorten the duration of unemployment and consequently the depth of the recession. Technology can help governments do this at scale.

To support learning and skilling at scale, public sector leaders can:

6. Adopt cloud technology to modernize education, and scale content and resources to learners across geographies.
7. Work with industry to bridge the educational gap, which will be increasingly important as more schools offer online learning.
8. Education leaders have an opportunity to leverage new technologies to modernize education, extend online education to millions of students across geographies. Use data analytics to better understand and enhance student outcomes; and work with tech partners to extend connectivity to students in underserved communities.

COVID-19 proved that most public sector organizations can successfully transition to a modern workplace, offering employees flexible and remote working, and quickly adopting new tools to respond to changing needs and spawn innovation driven by cloud technology. The crisis precipitated new levels of openness, transparency, and collaboration and pushed governments to innovate at a faster rate in order to rapidly recover respond to their constituents. Seizing this momentum, and further expanding their use of cloud technology, offers governments the resilience, agility, and scalability they need not only to rebound from the crisis, but also to build systems and mechanisms to better respond to future challenges and build economies and systems which are even stronger than before.

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