

COVID-19 dynamics and economic impact

How the pandemic impacts the Telco industry

What Telcos should do

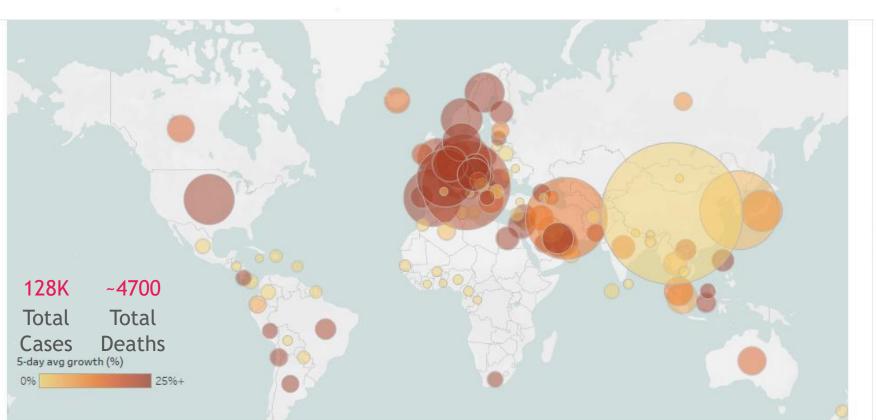
How we can help

COVID-19 dynamics and economic impact

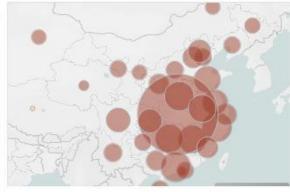
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Outbreak continues to accelerate in Europe and US

World-wide COVID-19 Cases as of 11 March (Link to animated map of daily movement)



Greater China cases



Europe cases

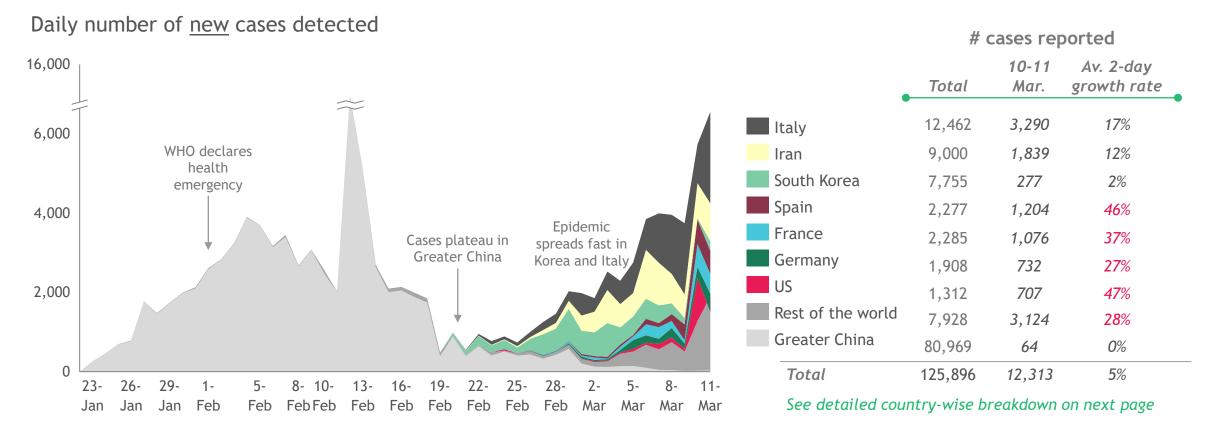






Many epicenters outside of China growing rapidly

Data as of 11 Mar



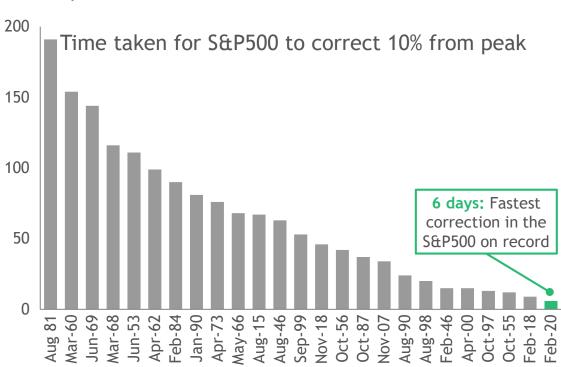




COVID-19 is causing financial and operational disruption

COVID-19 has triggered fastest ever S&P 500 correction...

No. of days



...COVID-19 starting to impact telco

Coronavirus causes Vodafone shops to close, **WABC** workplaces shut down as employees sent home

Breaking: Coronavirus forces shutdown of Galaxy Z Flip factory

SAMMOBILE

Coronavirus wreaks havoc on telco event calendar TELECOM Review

3 MARCH 2020

HEALTH

The San Diego Union-Tribune

Chula Vista AT&T employee diagnosed with coronavirus as county broadens outreach

"They closed six stores for cleaning, but the employee only worked at one, and the five additional stores were closed in an abundance of caution," Cook said. "The employees who did interact with this individual were self-quarantined for a 14-day period."

How the pandemic impacts the Telco industry

Our view on COVID-19 and the Telco sector

A mixed picture with some supply-side and operational risks contingent on the pandemic's evolution...

... contrasted by the opportunity to come out of this crisis more future-proof...

... and the clear reaffirmation of Telco's critical role in a functioning society



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A nuanced picture for telcos: COVID-19 with challenges, but also counterbalancing effects and evolving customer needs

1 Demand

Delay in demand countered by greater need and perceived value of certain products

- Fewer/ delayed transactions gross adds, up-sells, x-sells, device purchases
- Liquidity and payment challenges for some B2B customers
- Lower rates of churn and downspin
- Greater data consumption and demand for entertainment propositions
- Higher demand for remote connectivity, secure data connections, etc. esp. in B2B
- New product opportunities, esp. around e-health, public sector data access

2 Supply

Some supply chain risks, depending on evolution of pandemic, mitigated by delayed demand

- Device sales/delivery dampened due to breaks along lean supply chains (manufacturing-assembly-distru-sales-delivery)
- Roll-out and installation activities delayed due to disruptions in equipment supply, and/ or reduced ability to serve (access, workforce constraints), with risk to SLAs; some vendors/contractors pot. at risk
- Load on supply chains reduced as customers delay purchases and orders

3 Operations

Standard operations likely to remain stable, fault-related risks likely to increase

- No predictable risk to foundations of operations (energy supply, ops sites)
- Greater pressure on fault resolution and NW stability (and thus customer experience and SLAs), due to challenge of running effective call center and field force ops in light of staff/equipment/access constraints
- Some staff capacities may be freed up both on supply and on ops side due to reduced demand (esp. in B2B)

4

Adverse impact on employees' well-being - mitigated through an "elevated sense of purpose" for Telcos?

Business foundations

Likely negative impact on health, well-being, productivity

Some productivity issues absorbed through digital collaboration

Critical role of Telcos during crisis may provide heightened sense of purpose

Financial effects have to be analyzed and managed

4

Cash flow pressure caused by delayed demand, and potential inability to pay of some B2B customers

Delayed capex and opex outlays may bring temporary counterbalancing effect

erall

Retail store shutdown and quarantine measures over several weeks lead to massive drop in handset sales



Example Apple retail shutdown: After five weeks Apple stores still not fully recovered

Closed Open

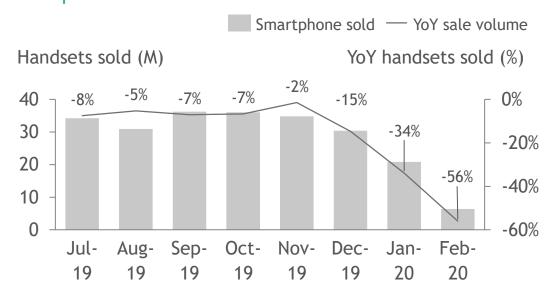
Share of open/closed Apple stores in China



- **Store closures:** On February, 1 Apple temporarily closed all 42 stores in China subsequent reopening still in progress
- Store closures in Italy as well: Apple is indefinitely closing all of its stores in Italy as the coronavirus continues to spread



Handsets sales crashed: Significant decline in overall smartphone sales

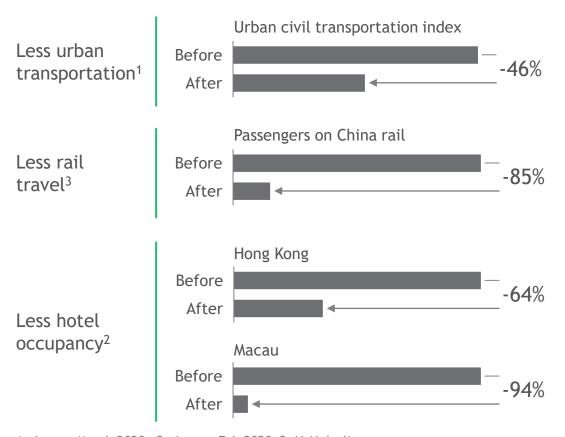


- Factory quarantine measures: Foxconn and Pegatron extended new year factory holidays leading supply shortage
- Additional nation-wide quarantine measures: People were advised in general to stay home when possible

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Increased demand: Data traffic consumption rises as people stay home

Less travel...



... and more data consumption

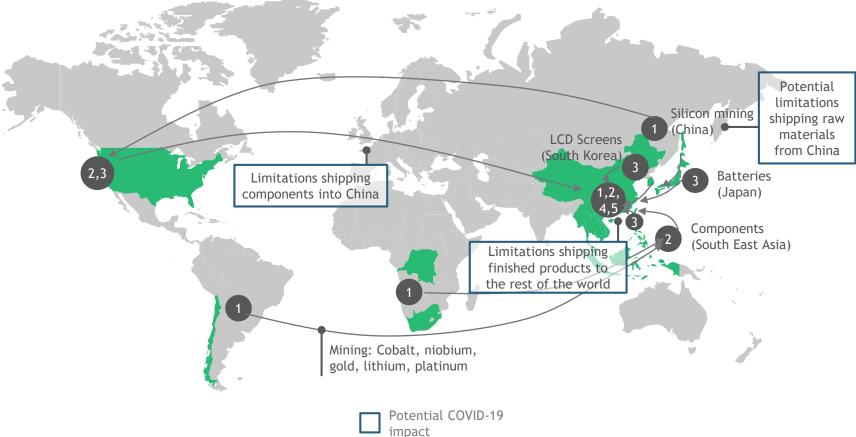
- Chinese people's average time spent on the mobile internet climbed from 6.1 hours to an astounding daily usage of 7.3 hours post-holiday as businesses delay returning to the office or resuming on-premises operation
- Weekly iOS app downloads in education and business categories increased by +200% in February, mainly driven by remote work and e-learning apps
 - China's quarantined club kids and gym rats turn to livestreaming

^{1.} Jan vs. March 2020 2. Jan vs. Feb 2020 2. YoY decline Source: STR; OAG Schedules Analyser; IATA updated impact assessment of the novel Coronavirus (5 March); desk research; SensorTower; press releases

Illustrative

Key regional steps in computer manufacturing value chain

- Metals imported, rare earth metals mined in China
- Components like silicon wafers, chips, and pc boards made in SEA, China and US
- Larger assemblies fabricated in the US, Taiwan, Japan, and Philippines
- Final assembly and testing in Chongqing
- Products shipped through Chongqing Port/Shenzen Port Worldwide



Global supply chains in electronics have many potential vulnerabilities as

components flow in and out of China multiple times during assembly process

Note: Based on Dell/Apple laptop supply chains

Source: BCG research

Example Network equipment supply chain: Disruption risk depends on supply chain setup and evolution of pandemic



Components & assembly



Shipping



Installation & maintenance

Key risk factors to be assessed

Selected

examples

- Degree of integration of manufacturing and assembly chain
- Sourcing from international suppliers
- Amount of buffer stocks / redundancy in chain
- Assembly in heavily affected geographies
- **Degree of automation** in assembly process



Reliance on inter-state /-national deployment teams



- Need to access sites & client premises
- Criticality of shipped equipment/ components (e.g. infrastructure critical items transported by government forces)
- Degree of buffer stocks / redundancy in chain of critical components/spares







- Manufacturing mostly independent from US and significant buffer stocks due to trade sanctions
- Limited COVID-19 spread in Shenzen (main location)



High degree of domestic T&L, some disruptions (trucking: less than 50% of staff¹) - but transport of critical items by military



Local workforce without travel restrictions - some inter-state



- Dependent on US suppliers (Intel, Qualcomm)
- Globally distributed assembly hubs might allow flexibility



Global reliance on disrupted T&L (e.g. Maersk canceled 50 sailings to and from Asia, Emirates grounding 50% of planes)



Reliance on cross-border teams which may be blocked

1. JOC

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Deep Dive shipping: Various transport & logistics (T&L) disruptions affect telco supply chains



Local T&L

Transport within China



Various disruptions as local governments conduct checks & screenings of trucks and priority given to transport of medical supplies and essentials. However analysis of movement of people and goods suggests quick rebound

Transport within Europe

Various disruptions of road freight, as national governments introduce border checks



6

Our trucking suppliers have resumed operations, although they are operating with less than 50 percent of their staff.

Spokesperson, Maersk China



Baltic Dry Index

Jan-

2015

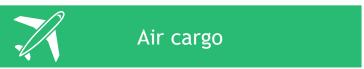


Global shipping in February among lowest levels in past 20yrs resulted in congestion of Chinese ports, but improvement in sight



The turning point has arrived... We are seeing that port congestion has eased and logistics start to revive

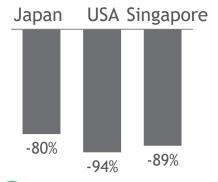
Xu Kai, Director of SISI



Passenger flights¹ - China to ...



- About half of air cargo flies with passenger jets
- Grounding of planes impacts cargo capacity & prices





China's air cargo capacity was down 39% in February relative to last year

Agility Logistics

The price is three times higher - at least because there is just no capacity Refael Elbaz, CEO, Unicargo



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We expect delays in the network rollout plans of impacted Telcos



Due to limited capacity, network roll-out and upgrades are a "scarce good"



Delays now will thus result in the push back of NW roadmaps with little chance of "catch up"



Product roadmaps and propositions will need to be adjusted



Most property owners are not allowing us to enter and build base stations inside [...] 5G construction plans in 2020 will definitely be affected by the epidemic

China Mobile Beijing BU, Feb. 2020



The epidemic will have a substantial impact on the 5G rollout. It will cause a labor shortage and affect construction due to the extended schedule

> Wang Xiaohui, deputy dean for Internet Industry at Tsinghua University, Feb. 2020



We have already seen 5G bidding projects postponed to varying degrees

Kai Cui, senior research manager at IDC China, Feb. 2020

Operations: Impact on people capacities and ability to resolve differs by activity

Impact on operations & maintenance of network from core to "the curb"

- Most severe risk on NOC as the "nerve centre" of critical infrastructure depends on degree of automation, remote access & measures for staff health
- <u>Capacities</u>: Teams (numbers, expertise) and availability of critical equipment may be constrained
- <u>Access</u>: Field services impacted to different degrees depending on degree of localization of teams (e.g. international maintenance crews in some smaller European countries, more local in N. America and Asia)

Impact on operations & maintenance of network "to the premise"

- <u>Capacities</u>: Teams (numbers, expertise) and availability of equipment may be constrained
- Access: Access to sites might be restricted for troubleshooting and resolution across individual homes, multi-dwelling units, B2B sites

Impact on service

- <u>Capacities</u>: Teams (numbers, expertise) may be constrained depends in part on extent of T-shaped roles and distribution/ fragmentation of vendors; call centers impacted because of necessity to reduce co-location an dpotential quarantines; some load relief possible due to fewer requests, especially in B2B, however possibility for higher inbound volumes in case of congestion or connectivity issues
- Access: Access to sites might be restricted for troubleshooting and resolution across individual homes, multi-dwelling units, B2B sites; access to retail as a service channel may be restricted

Impact of staff capacities in part driven by how inbound requests evolve (reduced demand vs increased service requests)

Potential impact on your ...



People e.g.,

- Overall feeling of insecurity & apprehension among employees
 front line employees especially at risk
- Travel restrictions hindering employees to return to their home country
- New working mode may be challenging for teams and overall communication



Purpose & Reputation e.g.,

- Challenge to retain company-wide culture and people connections during crisis
- Potential misalignment between shortterm commercial stress and need to show empathy and protect/ care for customers

Business foundations: Several key needs should be addressed



Liquidity & Financials e.g.,

- Cash flow pressure caused by ongoing sales constraints and potential inability of some B2B customers to pay
- Share price plunge & increased money lending cost due to investor uncertainties

What Telcos should do now



Telcos are in a unique position to help people during this major crisis

Staying connected with family & friends, enabling remote working and education, assisting the government in crisis response

How Telcos need to act in this crisis



Now: Tackle immediate priorities

Protect your people, ensure continuity, and mitigate short-term losses



Near-term: Prepare for the rebound

Pro-actively seize demand rebound and bring business back on track



Medium-term: Pursue structural enhancements

Build advantage by making strategic enhancements and building resilience



Day-to-day agile approach to navigate changing environment

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Each Telco needs to craft their individual response across key timeframes



Now: Tackle immediate priorities



Near-term: Prepare for the rebound



Medium-term: Pursue struct, enhancements

Demand

- Address short term needs of B2C&B2B e.g., data upgrade, home office package, liquidity
- Take immediate action to divert sales traffic online, e.g., via campaigns
- **Engage with government** on crisis response
- Monitor channels to catch inflection point, prepare rebound offers, marketing, campaigns

 Build out portfolio across B2C and B2B for "new normal" (home working, data needs, ...) and for additional services (e.g. e-health)

Supply

- Continuously update inventory planning, prioritizing critical components and SLAs
- Ensure critical supplier/partner stability
- Enable channels for comms., new offers
- Explore emergency BB install capacity
- Address and fulfill online sales demand by e.g.,
 virtual store, e-sales functionalities
- Ensure robust catch-up supply
- Re-evaluate just-in-time across components
- Revisit product/ prop roadmaps in light of rollout delays
- Stand up D2C1 delivery capabilities

- Drive digitalization including online sales, D2C and remote delivery
- **Upgrade channel capabilities** incl. staff flexibility, remote working
- Build supply chain resilience

Operations

- Get your **ops COVID-19 ready** shifts, pods, scheduling, etc. in NOCs, call centers, Field Force
- Prioritize rosters and dispatch towards fault resolution over growth
- Enable channels for comms

- Make **NOC** more **crisis-proof**
- Cross-skill ops workforce
- Ensure capacities to pursue re-bound
- Use crisis to accelerate data-driven digital capabilities, incl. automation and remote access across NOC, NW, Ops
 - Boost digital & remote service channels

Business foundations

- Communicate and protect your people e.g., modularization, home working
- Manage financial stability & investor relations e.g, stress test cash flow
- Leverage your assets to protect society
- Safeguard company wide-culture and connection e.g., reward ideas
- Increase workforce flexibility
- **Strengthen reputation** as pillar for society e.g, social impact campaigns
- Adapt financial planning e.g., re-define budgets and targets monthly

- Learn from the impact to **improve crisis** management e.g., playbook
- Accelerate new ways of working and digital collaboration e.g., digital tools

Demand: Action items and example set of levers



Now: Tackle immediate priorities

Address short term needs of B2C&B2B

- B2C: Develop short-term offerings to address data needs (e.g. data booster)
- B2B: Sufficient capacity in Webex and connectivity; "ready-to-use" work from home package (camera, headset, data)
- More flexible payment terms for some cash-constrained B2B customers

Take immediate action to divert sales traffic online

- Develop GTM campaigns (TV, email, direct mail, social) to incentivize online traffic
- Develop call center scripts to divert retail resolution/ closure to online

Engage with gvt. on crisis response

- Engage with government e.g., data provision for early detection of risk areas
- Provide support to customers/ distributors



Near-term: Prepare for the rebound

Monitor channels to catch inflection point, prepare rebound offers, marketing, campaigns

- Conduction of scenario assessment (via salesforce/surveys) on possible "inflection time point"
- Proactive identification of capacities and push upgrade offer when limit approaches
- Retail simulation via building virtual stores to bridge potential store closure (e.g. browser based or VR)
- Closely monitor competitor moves, traffic and call center interactions
- Potential "comeback celebration campaigns" & quick ad spending pick up



Medium-term: Pursue structural enhancements

Build out portfolio across B2C and B2B for "new normal" and for additional services

- More focus on data-centric offerings like remote working, video conferencing, elearning, etc.
- Additional services such as
 - Improved cybersecurity solutions
 - Health monitoring for companies or government authorities
 - Telemedicine offerings for hospitals, pharmacies and residential aged care
 - Self-diagnosis offering for consumers (esp. in emerging markets)
- Boost of e-commerce and online service delivery

Google IIIIIII IIII

Offer for teachers and high-school students in affected areas

- Campaign under hashtag #LaScuolaContinua
- Free E-learning solutions for remote classes due to school closures
- 590k users in the first week of the crisis

Examples: Italian Telcos reacted quickly to COVID-19 outbreak with new offerings



Offer for consumer & business customers in affected areas

- Free 100GB mobile data package
- Unlimited national calls from mobile and landline
- Free VOD
 entertainment via
 TIMvision



Offer for consumer & business customers in affected areas

- Free 100GB mobile data package
- Unlimited national calls from mobile and landline



Offer for consumer customers suffering of COVID-19

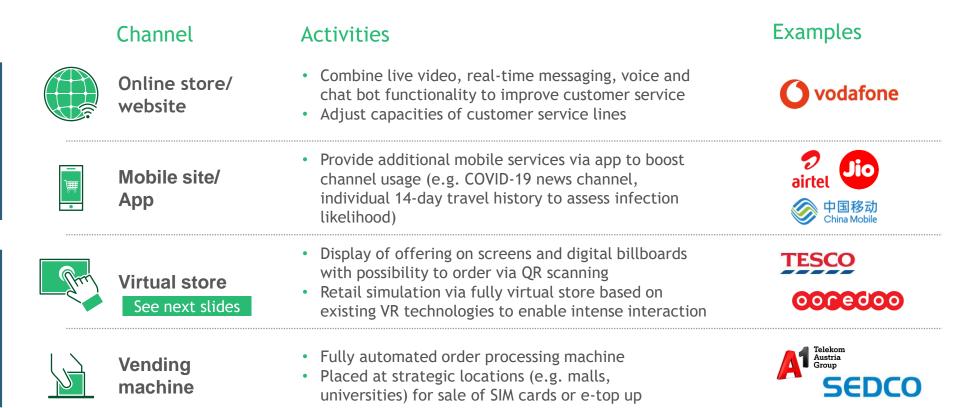
Free 100GB mobile data package

How to bridge potential store closures and fulfill consumer demand

Strategies to cope with store closures

Leveraging existing online channels

Set-up virtual channels



Example Ooredoo: Demo virtual store

https://shop.ooredoo.qa/?u tm_source=homepage_men u&utm_campaign=AugLaunc h#/



Supply: Action items and example set of levers



Now: Tackle immediate priorities

Continuously update inventory planning e.g,

 Monitor & adjust inventory levels in real time to avoid shortages of critical components & to foresee demand rebound

Mitigate critical supply chain ruptures e.g.,

- Assess alternative sourcing (e.g. secondary market) for critical components, plan for changing lead times and re-route logistics
- Explore emergency backbone supply and install capacity (e.g. transport of systemically critical items by military)

Ensure critical supplier/partner stability e.g.,

 Set up dedicated funding or adjust terms to address cash flow concerns

Ensure delivery on critical SLAs e.g.,

 Prioritize SLAs and set up resource plan which allows to serve critical ones



Near-term: Prepare for the rebound

Ensure robust catch-up plan based on potential inflection point e.g.,

- Create transparency on order backlog & halted operations (e.g. roll-out) plan resources to ensure fast procurement & delivery once the outbreak recedes (staggered operationalization plan)
- Revisit product/prop roadmaps in light of rollout delays

Re-evaluate just-in-time vs. stocking e.g.,

 Stress-test stocking of critical components (increase buffer stocks)

Adapt sales and delivery capabilities e.g.,

- Boost online sales capabilities e.g., virtual store, e-sales functionalities
- Stand up D2C1 delivery capabilities



Medium-term: Pursue structural enhancements

Build supply chain resilience e.g.,

 Explore further diversification of international supply chains - ongoing contingency planning as "new normal"

Drive digitalization e.g.,

 Build out digital sales channels (incorporate learnings during crisis) and direct-to-consumer delivery channels in B2C and virtual/remote delivery in B2B

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Operations: Action items and example set of levers



Now: Tackle immediate priorities

Get your sites COVID-19 ready (e.g. NOCs, call centers, field force) e.g.,

- Alternate shifts with smaller skeleton crews (strict overlap management)
- Create physical barriers/pods and restricted areas within buildings to isolate teams
- Enable remote work, e.g. establish "call center from home" / remote NOC mgmt.
- Plan for the worst: Set up redundant mgmt. core teams, refine disaster plans

Prioritize roster and dispatch towards fault resolution over growth e.g.,

- Deploy idle roll-out teams to fault resolution/servicing (in fixed, less in mobile)
- Boost inbound call center resources
- Address exp. VPN gateway pressure train call center agents on VPN (quick scripts,...)
- Train customer-facing staff in empathy



Near-term: Prepare for the rebound

Make your NOC more crisis-proof e.g.,

 Enhance remote access to NOC (dev.time 6 months), start early in case crisis takes longer than expected

Cross-skill operations workforce e.g.,

- Develop broader / t-shaped roles in service channels to deploy more flexibly
- Enable retail personnel technically & skill-wise to flexibly serve as call-center agents to increase capacity on demand

Ensure capacities to pursue re-bound e.g.,

 Log all halted operational activities and define prioritized, staggered execution roadmap for when the virus recedes



Medium-term: Pursue structural enhancements

Use crisis to accelerate data-driven digital capabilities e.g.,

 Automation of your business, e.g. using AI-based solutions, especially around SDN, NOC and customer service

Boost digital & remote service channels e.g.,

- Build remote access capability across NOC, network and operations
- Deploy resources to jumpstart social/020 strategic collaborations, and pilot test new operation models

Business foundations: Action items and example set of levers



Now: Tackle immediate priorities

Communicate and protect your people e.g.,

- Modular your team size into smaller teams
- Clear conversations on remote working
- Enable individual & workplace hygiene
- Support and monitor employee health
- Decisive & regular communication to prevent misinformation & org. paralysis

Manage financial stability & investor relations e.g.,

- Task force for scenario planning
- Stress test impact on cash flow, stabilization e.g. by mitigating or redirecting discretionary spend
- Transparent communication of upside potential to financial markets

Leverage your assets to inform society e.g.,

 Provide relevant information to your customers (e.g. news, protection advice)



Near-term: Prepare for the rebound

Safeguard company wide-culture and connection e.g.,

- Identify communication channels & pass information in a timely manner
- Rewarding innovative ideas and proactive movements
- Educate employees on COBID-19

Increase workforce flexibility e.g.,

- Set up required infrastructure for efficient remote working (communication, etc.)
- Adjust hiring & adapt existing workforce

Strengthen reputation as pillar for society e.g.,

- Market-wide social impact campaigns
- Launch external communication on initiatives taken to protect customers

Adapt your financial planning e.g.,

 Re-defining financial budgets and targets monthly by geography



Medium-term: Pursue structural enhancements

Learn from the impact to improve crisis management e.g.,

- Conducting employee surveys to identify what went well in crisis management and what should be changed next time
- Developing a robust playbook of the lessons learned and procedures to be pulled in case of new crisis

Accelerate new ways of working and digital collaboration e.g.,

- Adopting best practices in teaming & new ways of working during and after crisis
- Accelerate best practices in digital collaboration (e.g., implement tools)

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US/EU Companies are taking increasingly aggressive preventive measures

Туре	Restriction	Example companies	
Office visits	No on-site job interviews	facebook Google	amazon
Events or meetings	Cancelling large events	Most companies	
	Banning attendance at non-critical and/or large meetings	twikter IBM.	sforce
	Banning all meetings	fastly	
Travel	Ban on travel to highly impacted areas	Most companies	
	Only mission-critical trans-continental travel, domestic allowed	cîti CNN Google	J.P.Morgan
	Only mission-critical trans-continental <i>and</i> domestic travel	Goldman Sachs L'ORÉAL Solesforce FLAT CHRYSLER AUTOMOBILES Unilever Luitter amazon WELLS FARGO	Cargill Nestle
Work location	Work from home in heavily affected areas	Most companies	
	Work from home in mildly affected areas	FACEBOOK amazon	VIKE
	Everyone to work from home (advice or requirement)	fastly	salesforc

Communicate openly with empathy



Identify communication channels

- Identify best communication channels, practices and frequency
- Create a backward channel to address employee concerns, questions and ideas
- Ensure that all employees have access to real-time communication
- Prepare an external communication channel on people related issues



Organize a clear communication structure

- Steer communication centrally
- Make a senior company executive responsible for communication
- Emphasize adherence to rules and compliance



Pass information to employees in a timely manner

- Keep track of new developments—WHO, CDC, BMG, NHS
- Send frequent updates on the situation, rules and guidelines
- Address rumors rising among employees and the general public
- Maintain a hotline for pressing issues



Educate employees and managers on COVID-2019

- Set up FAQ pages and organize virtual town hall meetings on how to avoid, diagnose and treat COVID-2019
- Extend the scope of information to employees' families

Best practice examples



Microsoft VP Kurt DelBene sent e-mails to employees on remote work, travel restrictions, prevention and symptom recognition



Google CEO Sundar Pichai and CFO Ruth Porat called on Google employees to mobilize during big moment, lean on each other and support Google's vital societal role



Facebook issued clear engagement guidelines and restrictions to all their employees and business partners



Chinese national hotel chain Huazhu leveraged their own information platform app Huatong to inform their employees and franchises

How we can help

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We propose to (virtually) meet and discuss what really matters now



Where we are: Corona update - Current status & scenarios



What it means for you: Impact on your customers, your supply chain, your operations, your people



Key trade-offs: What are the difficult decisions you face now



Your action plan: Potential responses & measures - what to do now, and what to plan for



Immediate measures: Best practices to manage this crisis in a robust way - rapid response rooms, comms, ...

We need to address
your individual
challenges,
and leverage what
best practices we are
seeing within telcos,
and across industries

Legal context regarding our support

The situation surrounding COVID-19 is dynamic and rapidly evolving, on a daily basis. Although we have taken great care prior to producing this discussion document, it represents BCG's view at a particular point in time. This discussion document is **not** intended to: (i) constitute medical or safety advice, nor be a substitute for the same; nor (ii) be seen as a formal endorsement or recommendation of a particular response. As such you are advised to make your own assessment as to the appropriate course of action to take, using this discussion document as guidance. Please carefully consider local laws and guidance in your area, particularly the most recent advice issued by your local (and national) health authorities, before making any decision.

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