COVID-19
Supply Chain
Navigating Your Business Through Turbulent Times

March 2020
COVID-19 has been affecting businesses. Unfortunately, what we see today might only be the beginning.
Companies are facing external and internal challenges - both require reactive or preventive actions

**Decreasing / Changing Demand**
- Reduced sales in e.g. highly affected areas such as China, South Korea, Italy, Germany etc.
- Unforeseeable buying behavior driven by news, media and governmental conditions

**Supply Disruption**
- Supply shortages, interruptions and delays due to closed factories, factories with workforce and or supply challenges, supplier bankruptcies, delayed processing at borders

**Economic Uncertainty**
- Low investment rates, fear of recession, shortages in lending operations

**Production / Internal Supply**
- Low forecast / planning accuracy
- Demand for high flexibility based on demand, supply and workforce challenges

**Workforce**
- Limited workforce availability
- Change in culture e.g. home office, travel restrictions
- Short-time work (“Kurzarbeit”)

**Financial & Regulatory Issues**
- Financial troubles such as low cash flows, outstanding or delayed payments

**Reactive actions:** Immediate response to current challenges (crisis is already hitting your company)

**Predictive actions:** Ensure business continuity based on potential future scenarios
There is no time to waste – five mandatory actions to navigate through the current crisis

1. Quickly establish a task force
2. Leverage latest tools, technologies and data analytics to create transparency
3. Establish a short-, mid- and long-term mitigation plan for demand, supply and workforce
4. Access governmental support and cross industry synergies / partnerships
5. Prepare for the up-swing – “History shows that SC struggle most with the up-swing”
Order of the day: Ensure business continuity and minimize P&L impact

Crisis reactive approach
(Crisis is already hitting your company)

- Optimized production output
- Minimized sales impact
- Improved customer satisfaction
- Focus on EBIT drivers across the value chain
- Elimination of waste
- Identify alternative suppliers

- Compensation of financial losses
- Governmental support
- Agile COVID-19 impact mitigation
- Competitive advantage
- Improved cash flow
- Realize immediate price reductions

Predictive approach
(Proactive crisis prevention)

- Prepare for COVID-19
- Reliable crisis warning and monitoring system
- Understanding of weaknesses
- Preemption of impact
- Crisis as opportunity – higher market share
- Search for alternative materials

- Preemption of financial losses
- Immediate response to root causes
- Higher workforce satisfaction
- Competitive advantage
- Understanding of any Governmental support
- Search for alternative suppliers

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Companies need to tackle this challenge through fire fighting the acute challenges as well as planning for future disruptions.

<table>
<thead>
<tr>
<th>Criticality Assessment</th>
<th>Mitigation Action Plan</th>
<th>Execution</th>
<th>Maintain Crisis Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reactive</strong></td>
<td></td>
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</tr>
<tr>
<td>Criticality &amp; Root cause Analysis</td>
<td>Mitigation Action Plan</td>
<td>Execution</td>
<td>Maintain Crisis Resistance</td>
</tr>
<tr>
<td>Demand Workstream</td>
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<tr>
<td>Source and Supply Workstream</td>
<td></td>
<td></td>
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<tr>
<td>Production/ Internal Supply Workstream</td>
<td></td>
<td></td>
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<tr>
<td>Back-office (HR, Tax, Finance etc.) Workstream</td>
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<td><strong>Predictive</strong></td>
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</table>
For both approaches a holistic assessment of the end-to-end Supply Chain is required.
PwC’s Supply Chain risk model accesses various leading data sources for a comprehensive end-to-end risk assessment

### Global data sources

**Operational Risk**
- VEDR Analytics
- RapidRatings
- RiskWatch
- USGS
- ADR
- Country Risk Monitor
- Regional Risk Monitor
- World Economic Forum
- Euromoney
- Standard & Poor’s
- S&P

**Financial Risk**
- Moody’s
- S&P
- World Bank
- Euromoney
- Standard & Poor’s

**Geopolitical Risk**
- IHS Markit
- CERI
- World Bank
- Euromoney
- Standard & Poor’s

**Regulatory Risk**
- IHS Markit
- CERI
- World Bank
- Euromoney
- Standard & Poor’s

**Social Media**
- Facebook
- YouTube
- Twitter
- Instagram
- Pinterest

### Description

**Our PwC 4.0 operations risk model provides an holistic approach:**

- We leverage all key data sources for the risk assessment.
- The assessment will be conducted for each individual node (e.g. supplier).
- As well as for the entire Supply Chain Network.

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We will leverage our digital tools to create fast insights of individual suppliers and of the entire supply chain network.

- We will analyze both, the individual supplier risk as well as the overarching Supply Chain risk.
- Leveraging technologies such as AI, semantic analysis, knowledge graphs and machine learning (ML) we will assess connections and risks affecting your business.
- This way, not obvious relationships to the firm, e.g. secondary and tertiary relationships, can be uncovered and their criticality assessed.

**Supplier Risk Profile (one node)**

- [YouTube](https://youtu.be/LYkLHJU6iYu)

**Supplier Risk Network (all nodes)**

- [YouTube](https://www.youtube.com/watch?v=pPx9zBT7y6U)
Considering the current situation, we are fully prepared to work remotely with you, your suppliers and customers.

Interactive working/Virtual Whiteboards

Scrum boards

Workflow & project mgmt.

Channeling communication

Enterprise Plattforms

Online Meetings
To tackle your acute and future COVID-19 related challenges, we propose the following four step approach:

<table>
<thead>
<tr>
<th>Step</th>
<th>Criticality Assessment</th>
<th>Mitigation Plan</th>
<th>Execution</th>
<th>Continuous Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Establish a task force</td>
<td>Mobilize teams beyond task force</td>
<td>Execute weekly sprints in the different teams e.g. Supply Team, Demand Team, etc.</td>
<td>Conduct periodical workshops for general evaluation of capabilities to resists COVID-19 crisis</td>
</tr>
<tr>
<td></td>
<td>Assess impact of root causes/potential risks on the entire supply chain and back-office functions</td>
<td>Develop detailed action plan/backlog incl. RACI, due dates, team members</td>
<td>Constantly measure progress and raise potential new challenges</td>
<td>Develop roadmap to improve future crisis resistance</td>
</tr>
<tr>
<td></td>
<td>Develop crisis mitigation and prevention plans and prioritize</td>
<td>Set-up agile Crisis Management Office (PMO)</td>
<td>Reprioritize and refine backlog based on as-is situation</td>
<td>Train the trainer and build crisis resistance capability</td>
</tr>
<tr>
<td></td>
<td>Execute immediate actions</td>
<td>Implement a strong chain of command with agile elements</td>
<td>Monitor upswing opportunities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop communication plan (internal &amp; external)</td>
<td>Implement task force structures &amp; standards</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Define resource requirements</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- ✔ First immediate actions initiated
- ✔ Structured root-cause/risk analysis of COVID-19 impact
- ✔ Detailed mitigation plan
- ✔ Communication plan
- ✔ Resource requirements
- ✔ Agile but standardized way of working
- ✔ Crisis management office incl. tools
- ✔ Detailed execution plan – including up-swing
- ✔ Constant impact refinement
- ✔ Agile execution to cater for potentially changing challenges
- ✔ Action, impact and success tracking
- ✔ Aligned & structured communication to suppliers, customers and team
- ✔ Implemented continuous improvement process
- ✔ Trained trainers and prepared workforce
- ✔ Roadmap
Firstly, we will support you with installing a task force that is equipped with standardized tools and procedures.
Next we will jointly capture the root causes of your current business disruptions...

### Heatmap - root cause assessment of affected products/ families

<table>
<thead>
<tr>
<th>Products/Affected areas</th>
<th>Sales</th>
<th>Supply</th>
<th>Production</th>
<th>Finance</th>
<th>Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product/Product Family A</td>
<td>✔️</td>
<td>✔️</td>
<td>Green</td>
<td>Red</td>
<td>Yellow</td>
</tr>
<tr>
<td>Product/Product Family B</td>
<td>Red</td>
<td>Red</td>
<td>Green</td>
<td>Green</td>
<td>Red</td>
</tr>
<tr>
<td>Product/Product Family E</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Product/Product Family F</td>
<td>Red</td>
<td>Red</td>
<td>Red</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
</tbody>
</table>

**Description**

- Root cause analysis will be conducted on two dimensions (product based and area/function based).
- Each relevant Product/Product Family as well as function/area will be individually assessed with regards to business disruption due to COVID-19 crisis.
- Result of the root cause assessment will be displayed in a heatmap which provides a good overview of the root cause origin.

Legend:
- Green: Business as usual
- Yellow: Medium disruption
- Red: Critical disruption (immediate action required)
- Grey: Not relevant/no concerns

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... and assess the impact of each root cause to the entire business and, if required, react immediately

<table>
<thead>
<tr>
<th>Root Cause</th>
<th>Impact Scoring</th>
<th>Impact</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>40% Drop in Sales Market B (APAC) for Product family A</td>
<td>Low 3 Medium 6 High 9 Severe 12</td>
<td>• 10.000 fewer products and in Plant A &amp; 20.000 fewer products in Plant B to be produced   • Plant A: Utilization drop of 30% &amp; Plant B Utilization drop of 10% • Revenue reduction by 15%</td>
<td>• We will analyze and score the impact of each root cause thoroughly   • For root causes with severe impact we will execute immediately we will leapfrog/ accelerate the proposed process to achieve fast results</td>
</tr>
<tr>
<td>Supplier A not able to ship part X due to plant shut down</td>
<td>Low 3 Medium 6 High 9 Severe 12</td>
<td>• Utilization drop of 30% in Plant N for line A • Weekly revenue loss of €260k</td>
<td></td>
</tr>
<tr>
<td>Supplier B not able to ship part X due to plant shut down</td>
<td>Low 3 Medium 6 High 9 Severe 12</td>
<td>• No supply of machine spare parts from Supplier from Country B (EMEA) • Production cost will increase since non ideal machine to be used for production • Overtime might be required</td>
<td></td>
</tr>
<tr>
<td>Due to Corona outbreak utilization drop of 30% in plant</td>
<td>Low 3 Medium 6 High 9 Severe 12</td>
<td>• Output of Product/ Product family E, F,G reduced by 15% • Revenue reduction by 20% • Supply shortages in Asia starting next week • Risk of losing key customer x to competitors</td>
<td></td>
</tr>
<tr>
<td>Customer C has cashflow issues and is unable to pay on time</td>
<td>Low 3 Medium 6 High 9 Severe 12</td>
<td>• Accounts receivable will increase • Limited impact on cashflow situation</td>
<td></td>
</tr>
<tr>
<td>Financial challenges of single source supplier</td>
<td>Low 3 Medium 6 High 9 Severe 12</td>
<td>• Supplier filed bankruptcy • Days of Inventory are 30 days due to reduced sales • Existing stock of supplier would provide time to find a replacement immediate action required</td>
<td></td>
</tr>
<tr>
<td>Controls at border slow down supply of critical goods</td>
<td>Low 3 Medium 6 High 9 Severe 12</td>
<td>• Production of part A needs to be delayed by 2 days (immediate actions can be handled by production planner)</td>
<td></td>
</tr>
</tbody>
</table>
Through a detailed FMEA, we will assess and evaluate all COVID-1350 related future risks for your business.

**FMEA – criticality assessment of impact in epidemic crisis**

<table>
<thead>
<tr>
<th>Product/Product Family</th>
<th>Workstream Affected Areas</th>
<th>Crisis Effect/Fail Impact</th>
<th>Potential Failure Cause and detail of likelihood</th>
<th>Preventive Detection Action/Comment</th>
<th>Probability</th>
<th>Severity</th>
<th>Criticality</th>
<th>Risk Priority Number (RPN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A Sales</td>
<td>Market A (EMEA)</td>
<td>Drop in sales</td>
<td>Low impact on business (revenue, etc.) Finance or workforce (low. Threshold to be defined by peer group company)</td>
<td>No Action Possible</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>2A Sales</td>
<td>Market A (EMEA)</td>
<td>Revenue drop</td>
<td>High impact on business (revenue, etc.) Finance or workforce (low. Threshold to be defined by peer group company)</td>
<td>No Action Possible</td>
<td>4</td>
<td>2</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>3A Sales</td>
<td>Market A (EMEA)</td>
<td>No impact</td>
<td>High impact on business (revenue, etc.) Finance or workforce (low. Threshold to be defined by peer group company)</td>
<td>No Action Possible</td>
<td>4</td>
<td>3</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>4A Sales</td>
<td>Market B (APAC 1)</td>
<td>No impact</td>
<td>High impact on business (revenue, etc.) Finance or workforce (low. Threshold to be defined by peer group company)</td>
<td>No Action Possible</td>
<td>4</td>
<td>4</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>5A Sales</td>
<td>Market B (APAC 1)</td>
<td>No impact</td>
<td>High impact on business (revenue, etc.) Finance or workforce (low. Threshold to be defined by peer group company)</td>
<td>No Action Possible</td>
<td>4</td>
<td>5</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>6A Sales</td>
<td>Market B (APAC 1)</td>
<td>No impact</td>
<td>High impact on business (revenue, etc.) Finance or workforce (low. Threshold to be defined by peer group company)</td>
<td>No Action Possible</td>
<td>4</td>
<td>6</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>

**Description**

- FMEA will be conducted starting from the dimension of the product broken down to the dimension of workstreams and affected areas.
- Each relevant Product/Product Family as well as function/area will be individually assessed considering SEVERITY of impact/effect, PROBABILITY of crisis effect, and likelihood of DETECTION.
- The Product of this factors will be the RISK PRIORITY NUMBER (RPN).
To do so, we will look at the Supply Chain holistically with the support of our analytics tools.
In Step 2, we derive a detailed mitigation action plan with roles, resources, responsibilities and time lines

**Mitigation action plan**

1. **Cause**: Build-up improved planning on new Mustermann vendor
   - **Mitigation**: Implement audit of 3rd party
   - **Responsible**: Commercial
   - **Required Resources**: Personnel
   - **Start Date**: 05/03/2020
   - **Due Date**: 06/03/2020
   - **Progress**: Done

2. **Cause**: Overdue invoices by new vendor
   - **Mitigation**: Implement a payment system
   - **Responsible**: Finance
   - **Required Resources**: Personnel
   - **Start Date**: 07/03/2020
   - **Due Date**: 09/03/2020
   - **Progress**: Overdue

3. **Cause**: Security issues by new vendor
   - **Mitigation**: Implement a security protocol
   - **Responsible**: IT
   - **Required Resources**: Personnel
   - **Start Date**: 08/03/2020
   - **Due Date**: 10/03/2020
   - **Progress**: In progress

4. **Cause**: Quality issues by new vendor
   - **Mitigation**: Implement quality control
   - **Responsible**: Procurement
   - **Required Resources**: Personnel
   - **Start Date**: 09/03/2020
   - **Due Date**: 11/03/2020
   - **Progress**: In progress

5. **Cause**: Late delivery by new vendor
   - **Mitigation**: Implement a logistics protocol
   - **Responsible**: Logistics
   - **Required Resources**: Personnel
   - **Start Date**: 10/03/2020
   - **Due Date**: 12/03/2020
   - **Progress**: In progress

**Detailed Prevention/Mitigation work packages**

- The systematic root cause and impact assessment will be leveraged to develop detailed mitigation actions.
- Actions will either directly tackle the root cause and/or work on the impact.
- **Work packages** (one action or several actions) will be assigned to a dedicated team.
- Based on the prioritization the actions shall be assigned to one of the execution sprints.
- The action plan serves also for monitoring purposes and will be continuously updated and extended.

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The mitigation plan will lead to detailed work packages

**Current situation**
- **Delivery Performance**: 90% (-5%)
- **Plant utilization**: 70% (-10%)
- **Inventory levels**: 7 SKUs (Raw material) are below safety stock levels

**Status and prognosis**

<table>
<thead>
<tr>
<th>Work package progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current week</td>
</tr>
</tbody>
</table>

**TOP KPIs**

- **Utilization**
- **FG Stock**
- **Raw Stock**
- **Work-force**
- **OTIF Supplier**

**Long-term measures**
- Re-engineer critical parts to facilitate dual-supply
- Increase stock levels for selected raw materials
- Set-up supplier health check tools

**Short-term measures**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Mitigation action</th>
<th>Due Date</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>40% Drop in Sales Market B (APAC) for Product family A</td>
<td>Reduce “Arbeitszeitkonto” send selected WF on Kurzarbeit</td>
<td>20.03.2020</td>
<td></td>
</tr>
<tr>
<td>Supplier A not able to ship part X due to plant shut down</td>
<td>Insourse production or critical part x Select priority customer and inform others about delivery challenges</td>
<td>30.03.2020</td>
<td></td>
</tr>
</tbody>
</table>

**Description**

- We will leverage our proven reporting tools and process (we have been helping numerous suppliers in ramping-up their production to meet OEM deliveries)
- This enables to track progress and to provide full transparency about the success of the mitigation measures
In step 3, the actions will be executed in an agile way.

**Execution Sprints set-up for a fast and impact centric mitigation**

- **Criticality & Root cause Analysis**
  - Stakeholders/Client
  - Effects
  - Prioritization

- **Detailed Action Plan**
  - Mitigation Demand
  - Actions planning

- **Agile Execution-Sprints**
  - Crisis Mgmt. Office (Execution Team)
  - SCRUM Master
  - Review

- **Stakeholders/Client**
  - Project owner

- **Ex. Team**
  - Mitigate

- **Project owner**
  - Mitigate

- **Retrospective**
  - "Impact under control – business as usual"

**Description**

- The Crisis Management Office is always responsible for the sprint planning and monitoring of the progress.
- In an agile sprint approach the mitigation actions will be executed.
- In the review phase the impact mitigation will be assessed. Ineffective actions on the impact will be revised and adapted.
- Once the impact is under control action will be released due to urgency of the reactive approach.

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Finally, we will establish sustainable crisis capabilities within your company

*Train-the-Trainer concept to establish an agile working culture*

**Description**
- We will conduct workshops to upskill the workforce in order to create the required capabilities within the organization
- The regular workshops and the established agile working culture will enable the company to maintain the level of epidemic crisis resistance

**Responsibility**
- Certified coaches can lead Agile Crises impact Prevention/Reaction Initiatives independently
- Supports meeting facilitation and trainings, assists workstream owner and teams in concept creation and conduction
- Create aspects of target concept by engaging selected team members in workshops
- Participate in all activities, provide risk insights and drive prevention/mitigation actions

**Skill requirements**
- Participation in several agile crisis impact prevention/reaction initiatives with prior agile experience
- Prior agile experience or participation in 1 agile crisis impact prevention/reaction initiative
- Experience in managing teams and Agile experience
- No foreknowledge required

**Certified Agile Coach** (e.g. Certified Scrum Coach)
**Co-Coach** (e.g. Certified Agile Professional)
**Workstream/Product owner** (e.g. Head of Procurement & Supply Chain, Head of BU)
**Cross-functional Execution Team** (e.g. procurement specialist, shop floor associate, support functions)

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From Strategy through execution, we, PwC / Strategy&, can help you in this critical situation

Worldwide acting strategy consulting firm with focus on digital transformation of international companies from strategy through execution. Leveraging years of experience and global expertise to create value for the clients.

Leading consultancy in Supply Chain Management, Manufacturing and Product Development. Developed the Supply Chain Operations Reference Model (SCOR®) as well as the PACE (Product and Cycle-time Excellence).

Leading IT consulting firm and part of the PwC Network for technology-enabled business innovation and transformation enabled by Cloud services, Data & Analytics, AI, Industrial IoT, RPA and major digitalization technologies.

We are proud partners of world-leading technology companies for the internet of things, big data, advanced analytics and artificial intelligence. We are partnering with firms in the area of robotics as well as state-of-the-art digital players.
How can we help?

Gustav Baldinger
Partner
Advisory Services Lead
PwC Switzerland
Tel.: +41 79 650 1315
gustav.baldinger@ch.pwc.com

Dr. Reinhard Geissbauer
Partner
Manufacturing Lead PwC
Germany
Tel.: +49 170 939 1263
reinhard.geissbauer@pwc.com

Christoph Wellinger
Senior Executive Advisor
Supply Chain & Operations Lead
PwC Switzerland
Tel.: +41 79 791 2391
christoph.wellinger@ch.pwc.com

Dominik Hotz
Partner
Health Industries & Life Sciences Lead
PwC Switzerland
Tel.: +41 79 832 9049
dominik.hotz@ch.pwc.com

Stefan Schrauf
Partner
Supply Chain Lead
PwC Germany
Tel.: +49 151 461 23326
stefan.schrauf@pwc.com

Reto Brunner
Partner
Industrial Products / Retail & Consumer Lead
PwC Switzerland
Tel.: +41 79 510 0291
reto.f.brunner@ch.pwc.com