

# BUILDING RESILIENCE FOR SUSTAINABLE MANUFACTURING

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HOW TO IMPROVE RESILIENCE  
AND GROW YOUR  
BUSINESS SUSTAINABLY

**#FINLANDWORKS**

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# FINLAND – SMART, SUSTAINABLE AND RESILIENT

## YOUR WAY TOWARDS MORE RESILIENT BUSINESS STARTS HERE.

Welcome to the Resilience Guide 2021. This guide gives an outlook on risks in the Finnish manufacturing industry. Integrating preparedness into day-to-day decision making helps companies not only recover from crises faster, but also learn from the it. Resilient companies might even capture market share from their competitors.

When implemented in a smart way, resilience building actions can help a company grow their business while preparing for crises. Expanding one's customer base, building agility into the company's culture or using contract manufacturing and commercial off the shelf components are just some examples of win-win actions.

The main risks that were raised by companies during the study include pandemics, more frequent extreme weather events, as well as political risks manifested in Eastern Europe and between the US and China.

Risks that were less commonly mentioned in interviews but raised in the literature include solar storms, military conflicts, terrorism, meteorites and systemic cyber security threats.

This guide is aimed at particularly small and medium sized enterprises (SME's). It gives best practices for resilience from the viewpoints of good governance, procedures, managing supply and demand, people management, customer management and partnerships, as well as scenario work and strategy.

This guide also includes conclusions for building resilience on a national level. It compiles the best resilience practices, and disseminates the learnings applied to local context through ELY centres, chambers of commerce, and various local advocacy organizations.



### THE THREE KEY STEPS TO BUILD ANTIFRAGILITY ARE:

1. Build different scenarios, and prepare plans accordingly.
2. Build flexibility into your customer base, manufacturing strategy, supply chain management, company culture, and in your product and service offering.
3. Build trust with your key customers, partners, financiers and employees well in advance before a crisis hits.

Finland is one of the three most resilient societies globally. This advantage should be used to attract investments in sustainable manufacturing in Finland.

# RESILIENCE IN THE MANUFACTURING INDUSTRIES

RESILIENCE REFERS TO THE ABILITY TO BE SUCCESSFUL AFTER A DIFFICULT SITUATION, AND THE ABILITY TO RECOVER FROM OR ADJUST TO CHANGE.

## RESILIENCE IS A KEY TO RECOVERY

This guide uses the term resilience to describe the overall ability to recover from or to adjust to a new normal after a crisis or change.

The measure of the capacity of resilience is organization's ability to minimize damaging consequences. Resilient organizations can rapidly adapt to simultaneous or extensive systemic changes that occur within the organization, within the value net and within the larger society.

Resilience is seldom an inherent property – it needs to be systematically designed, planned and built.

Resilience is built on a cultural preparedness to change how the company works. That means willingness and ability to restructure strategic approaches, readiness

to consider and to evaluate new business models, partners and products, and also the ability to rapidly implement new or alternative operative modes.

Resilient organisations and networks are those that have the ability, organizational stability as well as agility and a culture that facilitates rapidly recognizing, reacting and counteracting the changes brought by systemic trigger events.

## MULTIPLE TRIGGER EVENTS CAN LEAD TO CRISES

Systemic risk refers to triggers that can lead to situations where the risk for financial instability is so extensive that economic growth and welfare suffer materially. The COVID-19 pandemic is one of many past and future, global natural events that has had, and will have, a profound effect on the business environment and our society.

Natural events that are systemic triggers range from the gradual, like the climate change, to the more immediate like earthquakes, storms, pandemics. Manmade systemic trigger events can be equally as devastating as natural ones. Manmade systemic triggers are for example a breakdown of supply chains or closure of logistics corridors due to political upheaval, a collapse of the financial markets (recessions, depressions) or terrorism and war.

## SUSTAINABLE MANUFACTURING IS RESILIENT

Sustainable manufacturing often refers to the creation of manufactured products through economically-sound processes that minimize negative environmental impacts, while conserving energy and natural resources. Sustainable manufacturing also enhances employee, community and product safety.

Resilience deals with themes that may seem contradictory to economically sound operations such as redundancy, reduction in complexity and reduction in coupling. But themes, such as risk awareness and flexibility go in line with sustainability. Resilience is part of sustainability, and resilient organizations ensure sustainability also in difficult times.

**“IF THERE’S NO DEMAND THEN A COMPANY SHOULD BE ABLE TO CHANGE THEIR PRODUCT, SERVICE, OR MARKET.”**

MATTI MANNONEN,  
EXECUTIVE DIRECTOR,  
INNOVATION AND  
ECONOMIC POLICY,  
TECHNOLOGY FINLAND

# THREE STEPS TOWARDS ANTIFRAGILE BUSINESS

BUILDING RESILIENCE IS A LONG-TERM WORK THAT NEEDS TO TAKE PLACE IN A COMPANY'S DAY-TO-DAY WORK.

## 1. BUILD SCENARIOS IN YOUR DAY-TO-DAY WORK

Building scenarios is an integral part of good governance and strategic development. When anticipating risks in scenario work, consider also what opportunities good preparedness might bring. Since one cannot build a risk-specific preparedness plan for every scenario, try to build plans that cater for a wide variety of risks.

## 2. BUILD FLEXIBILITY WHERE FEASIBLE

Some crises are difficult to anticipate, whereas others are nearly impossible. Building flexibility and diversity in your customer base, manufacturing strategy, supply chain management, company culture, and in your product and service offering can help you react quicker when unanticipated events shock the playing field. A crisis can be the best opportunity for you to gain market share, so never let a good crisis go to waste by letting it catch you unprepared.

## 3. BUILD TRUST BEFORE IT IS TOO LATE

Crises are a good moment to look for new opportunities, but they are not a good moment to build trust with your key customers, suppliers, employees or financiers. Investing in these relationships during good times will pay off dividends in bad times. Having deep partnerships with your customers and suppliers can help you innovate and produce new solutions faster and having trusted partnerships with your financiers can help you fund the business development thereof.

**"ANTIFRAGILITY IS BEYOND RESILIENCE OR ROBUSTNESS. THE RESILIENT RESISTS SHOCKS AND STAYS THE SAME; THE ANTIFRAGILE GETS BETTER."**

NASSIM NICHOLAS TALEB

# GOOD GOVERNANCE = RESILIENT COMPANIES

MANY THINGS CONTRIBUTE TO GOOD GOVERNANCE, FROM PLANNING AHEAD TO FLEXIBLE PRODUCT DESIGN.

## PREPARE SCENARIOS AND PLAN AHEAD

Scenarios are basis for preparedness, including financial oversight. Use parameters like sales development, order intake, supply shortages etc. Scenario work not only prepares for crises, but also increases your knowledge of the operating environment. Remember to consider customers' perspectives and operations at enough practical level.

## MAINTAIN FINANCIAL SOLIDITY

Financial solidity is like the pillars which hold up the roof of the building – it ensures that there is time to put down the flames before everything comes crashing down. Keeping the sales pipeline well above “sufficient” helps build resilience in a future-oriented manner.

## PLAN ROBUST DESIGNS

Resilience starts already from the product design and what flexibility it gives if crisis hits – the entire product life cycle needs to be considered. For example, using, when possible, commonly available standard components (COTS) that usually have several suppliers, makes a company less dependent on one specific key supplier and hence builds resilience. The same applies for robust processes.

## ITERATE PLANS

Update and reiterate plans and scenarios frequently based on the changing situation. Ensure agility and pivot fast if needed. When shifting from crisis to recovery mode, consider where you have prevailed better than competitors to strive for better market position. When the crisis is over, reflect on what you have learned and update your plans based on your learnings.



**RESILIENCE STARTS FROM FLEXIBLE PRODUCT DESIGN.**

# PLANNING AHEAD IS THE KEY TO SUCCESS

HAVING CLEAR PROCEDURES HELPS YOU FORWARD BEFORE AND AFTER A CRISIS.

## FOLLOW EARLY WARNING INDICATORS

Like fire detectors, put in place early warning indicators. Information for these can be sourced from technical perspective for example from supply chain control towers, or more personally e.g. from regular calls with clients or suppliers to develop silent understanding of underlying risks in your value network.

## PUSH THE CRISIS BUTTON

When a crisis hits, it is important to activate the joint effort by “pushing the crisis button” – i.e. clearly communicating the new modus operandi. It should be noted that the crisis button is not the same as a panic button – the idea is that some parts of the organization change, and others can continue to focus on business.

## ACTIVATE CRISIS COMMITTEE

Activate the pre-defined internal crisis committee or a war room including persons from various company functions with clear nominations of persons for different roles. Be prepared for changes to the decision-making criteria used in normal business mode. Ensure a good flow of information from the crisis committee to the rest of the company.

## DOCUMENT PROCEDURES

Clearly document procedures to ensure operational capacity even if persons would become unavailable during the crisis. HR practices need to be able to quickly substitute key persons if needed.

## PREPARE AND ADAPT

A resilient enterprise needs to have the capacity to be prepared to as well as the capacity to recover from crises. Actions to improve the recovery capacity are based on institutional knowledge registration actions: both knowledge registered from similar previous crises as well as the capabilities to learn and acquire knowledge regarding the new normal.

Actions to improve the preparedness capacity are based on preventive actions that are planned before the crisis occurs. Not all preventive actions are adequate for all disruptive events, and each company should assess which actions are generic enough to cover a wide range of crises.

**”COVID-19 SET AN EXCEPTIONALLY CLEAR EXAMPLE OF HOW CRITICAL IT IS TO PREPARE FOR CRISES – AND OF HOW DIFFICULT IT CAN BE.”**

SAULI ELORANTA,  
PROFESSOR OF PRACTICE, VTT

# MANAGING SUPPLY AND DEMAND

FROM DIVERSIFYING VALUE CHAINS TO STAYING CLOSE TO CUSTOMERS, THERE ARE MANY WAYS OF MANAGING SUPPLY AND DEMAND.

## DIVERSIFY VALUE CHAIN AND BUILD TRUST

Spreading risk in your value chain – e.g. looking for alternative geographic regions for procurement of key components – helps build resilience. Distributing and/or contracting manufacturing not only hedges towards risks such as shortages, but also improves responsiveness to positive spikes in demand. However, one should not forget building trust and partnerships when diversifying the value chain – adequately on-boarding a new partner can take years.

## DISTRIBUTE DECISION-MAKING

Distribution of decision-making to local functions or nodes enables staying on top of local regulation aspects, crisis funding opportunities, buyers’ decision-making sentiment and, in trade war related crises, protectionism. If you have a geographically distributed organization, share best practices, communicate actively, and be prepared to shift operations from region to another in an agile manner. A distributed, global organization can help you work around the clock when required.

## DEVELOP REMOTE OPERATIONS

Developing remote operations, i.e. sales, service and auditing mitigates risks related to crises that may limit the possibility to travel. Use digital means (AI, IoT, etc.) for your benefit. Virtual communication also makes operations more efficient as one can serve several time zones within the same day.

## UNDERSTAND REGULATIONS

When expanding to new markets, legal department needs to be on the spot on local regulative changes and how they might affect on contracts – also need to know who to trust locally - choosing the wrong partners can be costly. Moreover, the list of dual-use items – i.e. products that could be applied in arms production – is growing longer, and a company might risk getting on sanction lists if it does not stay on top of the latest regulation.

## STAY CLOSE TO CUSTOMERS

Supply chain diversification can materialize as work-arounds when local crises hit. Especially when distribution is localized according to your main markets, it is important to stay near the customers,

which also increases resilience in the logistic chains. On the other hand, keeping an open door for near-shoring or re-shoring and thus shortening the supply chains can also build resilience.

**MITIGATE SUPPLY RISKS BY DIVERSIFYING YOUR VALUE CHAIN AND ENGAGING SUPPLIERS TO COVER CRITICAL POINTS**

IMPACT ON REVENUE	HIGH	<ul style="list-style-type: none"> <li>• Monitor suppliers 24/7, ensure their manufacturing, distribution and warehouses are not in the same region</li> <li>• Diversify sole-supplier risk by purchasing from 2 suppliers rather than 1</li> <li>• Identify sub-tier suppliers that direct suppliers use for critical materials</li> <li>• Obtain insurance to cover for profits lost from risks you can't mitigate</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor suppliers 24/7, ensure they have comprehensive risk-management programs also for sub-tier suppliers, know where they build and store your materials</li> <li>• Identify sub-tier suppliers and mitigate sole-supplier risk through diversification or requesting them to stock parts in multiple locations</li> <li>• Obtain insurance to cover for profits lost from risks you can't mitigate</li> </ul>
	LOW	<ul style="list-style-type: none"> <li>• Monitor suppliers for changes that might increase their risk significantly, such as poor financial performance, restructuring, lawsuits</li> <li>• Identify suppliers that rely on the same sub-tier suppliers for critical materials</li> <li>• Seek geographic diversity between suppliers' manufacturing and warehouse sites</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor suppliers 24/7, know where they manufacture and store critical parts</li> <li>• If not possible to diversify supplier base, ask suppliers to store parts at multiple sites</li> <li>• Ensure that direct suppliers have comprehensive risk-management programs in place</li> <li>• Identify sub-tier suppliers and logistics paths</li> </ul>

LOW – TWO OR MORE SUPPLIERS    **SUPPLY CHAIN RISK**    HIGH – ONLY ONE SUPPLIER

## MANAGING SUPPLY CHAIN RELATED RISKS

Apply tier n stakeholder engagement plans to address resilience. Focus not only on your suppliers, but also their suppliers. Aggregate the plans made through your value network to assess which are the weakest links and how big is the risk they bear.

Apply also C-pricing to monetize the supply chain related risks and compare your alternatives:

- A-price: cost of the component +
- B-price: logistic cost for bringing the component to your factory +
- C-price: probable cost of failure or disruption due to production outage, higher monitoring costs, or reputational loss

# STRONG COMPANIES RELY ON PEOPLE

AN ANTIFRAGILE ORGANIZATION RELIES ON MULTI-SKILLED PEOPLE AND AN OPEN COMPANY CULTURE.

## BUILD AGILE & OPEN COMPANY CULTURE

A company culture that enables agility and flexibility is key. This is ensured by robust governance structure and that the entire personnel is engaged in the strategy work. The feeling within the company, for example openness and possibility to express opinions, is an important part of culture. Courage is ensured by a culture that does not punish mistakes but rather encourages learnings from them.

## INVEST IN A MULTI-SKILLED WORKFORCE

Train employees to be able to perform a multitude of activities, not just some narrowly assigned tasks. Staff might need to adapt to changing roles and decision-making chains in a fast-changing environment during a crisis.

The company culture should encourage to assuming roles beyond one's own normal operational sphere.

## COMMUNICATE & STAY CONNECTED

Communication and staying connected with the employees at the time of crisis is extra important. Weekly or even daily updates on the situation development bring clarity. Well-informed employees understand their personal part in taking the company out of the crisis as a survivor and even a winner.

## MAINTAIN RISK DIALOGUE

Maintain a regular dialogue between risk management experts and business line executives and ensure that they jointly address risk-related concerns stemming from all organizational levels.

WELL-INFORMED EMPLOYEES UNDERSTAND THEIR PART IN HELPING THE COMPANY OUT OF THE CRISIS.

## INVEST IN GOOD LEADERSHIP

Psychology, good leadership and good communication practices are needed to keep up employees' motivation and positive attitudes – this is key to continued functioning of operations and thus resilience. It also ensures that different nodes do not compete against each other but rather work together towards joint resilience.

## INSTRUCT CLEARLY

Ensure that clear instructions are put in place and applied with regards to changed standards related to e.g. hygiene, travel, remote work etc. However, it is important not to make conclusions based on incomplete data.

# BUILDING TRUST IS THE WAY FORWARD

GOOD PARTNERSHIPS AND SHARING INFORMATION IS VITAL IN A TIME OF CRISIS.

## CO-CREATE SOLUTIONS

Co-create solutions with your key customers – consider how the risk impacts their needs and adjust your products and services accordingly. In the best case, you might find a new business area in the new normal.

## BE SITUATIONALLY AWARE

Constant communication with key partners is important in times of crisis. Share best practices and even tools with your partners. Be situationally aware of your operational environment. Knowing which partners need support, which ones you can trust and which ones you cannot can be critical.

## BE OPEN ABOUT INFORMATION

Be open about information sources towards the customer, who might have different sources – create mutual understanding that information from various sources might vary – justify clearly your own decision making.

## BUILD CLOSE PARTNERSHIPS

Close partnerships can help localize when establishing your own local organization is too risky or unprofitable. Engage with your suppliers to understand their suppliers. The weakest link in your supply chain can be the tier n-x supplier – try to find cost-efficient ways to evaluate them as well.

## DIVERSIFY CUSTOMER SEGMENTS

Diversification in customer segments – either to different markets or through different products – increases resilience. If value for one customer segment decreases due to crisis, it is possible to focus more on some other segment that is not affected to the same extent.

## PLAN FOR RAMP-UP TOGETHER

Plan for ramp-up together with your key customers and suppliers to recover faster. In well integrated value chains, even sharing critical manufacturing resource, including employees, may be considered.



# ALWAYS ONE STEP AHEAD

A SMART COMPANY INTEGRATES RESILIENCE INTO THEIR STRATEGY AND TURNS CRISES INTO OPPORTUNITIES.

## CREATE AN ANTI-FRAGILE STRATEGY

Strategy should always consider the risks and opportunities that might realize in times of crises. Financial structure, expansion opportunities, and key partnerships are strategic level questions that should be considered not only based on their impact on day-to-day operations, but also how they build or weaken the company's resilience.

## INTEGRATE RESILIENCE INTO SCENARIO WORK

Scenario work enables agile strategy work and can facilitate communications within the management group. Strategy needs to be built on independent probabilities. Scenarios should also consider risks related to important IPR assets and R&D functions.

## EVALUATE PORTFOLIO DIVERSIFICATION

Sprawling roots can help a tree withstand tougher storms. Companies often divest less-profitable products or business lines for the sake of shareholder value maximization. However, a diversified portfolio can better withstand asymmetric crises.

## CONSIDER SHAREHOLDERS' INVESTMENT HORIZON

The shareholders' investment horizon may influence how much resilience can be emphasized in company management. Short-term goal-setting may not leave room for investing in preparedness.

**RISK MANAGEMENT  
IS AN INTEGRAL  
PART OF GOOD  
LEADERSHIP.**

## FACTOR IN RISKS TO KEY DECISIONS

The impact of risk should be included in cost and business calculations. A major disruption can have a financial impact of double-digit percentage points on a year's earnings – the probability of these types of disruptions occurring every few years should be valued in financial estimates when making future projections. This helps in evaluating which risks can be mitigated, which ones should be insured against, and for which ones you select to only brace for impact.

## INTEGRATE FLEXIBILITY

Built-in flexibility to various situations and agility at different levels, as well as in decision making and other procedures, need to be taken into the strategy.

## TURN CRISES INTO OPPORTUNITIES

Good leadership turns crises into opportunities and moments of renewal – the ability to turn learnings into a new direction is paramount. Risk management should be an integral part of good leadership and managerial decision-making.

# PREPARING FOR CHANGE IS A COMMUNAL EFFORT

FINNISH COMPANIES HAVE BIG DIFFERENCES IN THEIR LEVEL OF PREPAREDNESS. SMALL AND MEDIUM COMPANIES HAVE ROOM FOR IMPROVING.

## THE INDUSTRY HAS MANAGED FAIRLY WELL

The overall view from the study is that most manufacturing companies have been able to absorb the impact from the most recent COVID-19 crisis fairly well, all things considered. There would seem to be a strong correlation between company size and the level of structured preparedness: large multinational companies reported systemic scenario work focusing on crisis impact mitigation, pre-defined roles and processes for crisis management, and supply chain and sales contingency plans more often than SMEs.

However, many SMEs claimed that despite not having pre-planned processes in place, they had prevailed during the most recent crisis by being agile to respond to changing situations.

Overall, SMEs seem to consider their chances of influencing the impact of crises smaller than large companies.

Most companies, and especially SMEs, see the most recent crisis as an opportunity to build and improve their best practices in anticipation of a next crisis.

## INCREASING RESILIENCE FOR SMALL AND MEDIUM COMPANIES

For many smaller companies focused on day-to-day operations, there might be no resilience plan or consideration thereof in the company strategy. In addition to having no preparedness or resilience plan towards macroenvironmental risk factors, many small companies are subject to an external business risk if they are only supplying to 1-2 large local customers.

The innate risk in having a close partnership with a single buyer where technological and economical efficiency is enough, is that in such context there is no need to develop sales, marketing or other management processes outside of R&D and manufacturing in the company.

## THE NATIONAL ECOSYSTEM OF RESILIENCE BUILDING



# WORKING TOGETHER

OUTSIDE THE STEPS PRESENTED IN THIS GUIDE, THERE ARE OTHER WAYS TO IMPROVE RESILIENCE. COLLABORATION WITH OTHER COMPANIES AND STATE ORGANIZATIONS IS A GOOD PLACE TO START.

## SUPPORT DEVELOPMENT

Continuing what is already done – support in identifying opportunities presented by the crisis – and in tapping on to those investments by supporting R&D and export projects.

## SHARE INTELLIGENCE

Gather intelligence from public organizations such as the National Emergency Supply Agency, Team Finland foreign officials, and ministries, to identify, analyze and inform companies on high-level risk indicators, how to prepare for them, and what opportunities these risks might bring. Compile information from the field through relevant barometers and publish results regularly.

## FACILITATE LEARNING

Facilitate mutual learning and exchange of best practices with other companies – both on local fora (between similar companies) and in a global context (companies targeting same markets).

## BUILD COLLABORATION

Form a national crisis committee between societally significant companies and public officials that convenes annually to prepare for crises and is prepared to form an active group when crisis hits. The committee should be independent from political and lobbying agendas.

## PROVOKE CONVERSATION

Act as conversation opener and thought-provoker – some less-established companies might not realize the importance of preparedness if they have not undergone serious crises before.

## PROMOTE FINNISH RESILIENCE

Finland is one of the three most resilient societies globally. Companies benefit from promoting Finland's resilience and highlighting it as an attractive target for investments. Relatively flexible labor legislation and well-functioning healthcare help to build resilience on a company level.

## GET ANSWERS FROM A CRISES HOTLINE

Finland is founding a crisis hotline for export companies that could help answer crisis-specific questions such as travel policies, available government subsidies in target countries, hygiene requirements, trusted information sources, etc.

## HIRE INTERNATIONAL TALENT

The Finnish state has programs that help companies in securing the talent they need. Especially in the case of crises where cross-border travel is limited, operations might be hindered if key talent cannot enter Finland. Business Finland's Talent Boost program helps companies hire international talent.

**“NOT ALL BUSINESS SHOULD BE RECOVERED. ONE SHOULD ALSO AIM TO CREATE NEW BUSINESS MODELS.”**

SAULI ELORANTA,  
PROFESSOR OF PRACTICE, VTT

## FACILITATE PARTNERSHIPS

Help find suitable partner candidates in target markets. Finnish companies have a high level of mutual trust, however, finding trusted partners outside of a company's own network, especially in foreign markets, might benefit from support and local knowledge.

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