



## **D2.2 – SWOT+1st Resilience preparedness/business continuity plans in the industrial ecosystem/s**

**Project number:** 101074552

### **Silicon Eurocluster**

**Serving the electronics value chain for maintaining sovereignty in microelectronics, components and systems for a greener, more digital and resilient future Europe.**

<b>Call</b>	SMP-COSME-2021-CLUSTER		
<b>Topic</b>	SMP-COSME-2021-CLUSTER-01		
<b>Type of action:</b>	SMP-GFS	<b>Service</b>	EISMEA/I/02
<b>Start date of project:</b>	1 September 2022	<b>Duration:</b>	30 months

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.



Funded by the  
European Union

<b>Related WP</b>	WP2
<b>WP leader</b>	MESAP
<b>Responsible author (s)</b>	Alessia Menduni, Fabrizio Fallarini - MESAP
<b>Contributor(s)</b>	Alessia Menduni, Fabrizio Fallarini, Serena Zerbinati, Laure de Tassigny
<b>Planned delivery month</b>	M6
<b>Actual delivery month</b>	M8
<b>Document Dissemination Level<sup>1</sup></b>	SEN
<b>Document Nature<sup>2</sup></b>	RE

<b>Synopsis:</b>	Analysis and mapping of the current state of the art of the European electronics industry
<b>List of keywords:</b>	Business, Value Chain, Technologies, Resilience, Risk, Management, Analysis, SWOT, Plan

---

1

Dissemination Level	
<b>PU</b>	Public
<b>SEN</b>	Sensitive, limited under the conditions of the Grant Agreement

2

Nature	
<b>RE</b>	Report
<b>DEC</b>	Websites, patent filings, videos, et

## DOCUMENT HISTORY

Version	Status <sup>3</sup>	Date	Comments	Author
01	Draft/under review	17/03/2023	1 <sup>st</sup> draft	Alessia Menduni - MESAP
02	Draft/under review	30/03/2023	2 <sup>nd</sup> draft	Serena Zerbinati – Fabrizio Fallarini MESAP
03	Draft/under review	07/04/2023	3 <sup>rd</sup> draft	Alessia Menduni - MESAP
04	Draft/under review	26/04/2023	4 <sup>th</sup> draft	Laure de Tassigny - Minalogic
05	Issued	02/05/2023	Final version	Laure de Tassigny - Minalogic

3

**Status** (a status is associated to each step of the document lifecycle)

<b>Draft</b>	This version is under development by one or several partner(s)
<b>Under review</b>	This version has been sent for review
<b>Issued</b>	This version of the document has been submitted to EC

## Table of Contents

<b>1. INTRODUCTION</b>	<b>5</b>
<b>2. WHAT IS A SWOT ANALYSIS AND WHAT ITS POTENTIAL BENEFIT?</b>	<b>6</b>
2.1 How do you write a good swot analysis?	7
2.2 Analysis of the industry: the porter's 5 forces model	7
2.3 The PESTEL analysis: external factors can be risks	9
2.4 The VUCA methodology to face globalisation	10
<b>3. HOW TO MITIGATE VULNERABILITIES: THE RISK MANAGEMENT</b>	<b>12</b>
3.1 Classifying and measure risks to set up strategies:	12
3.2 How to quantify risks and set up a preparedness business & resilience strategy?	13
3.3 Risk management and decisions: the role of cognitive bias	15
<b>4. AFTER THE RISK ASSESSMENT: BUSINESS CONTINUITY PLAN TO FACE AND CHALLENGES</b>	<b>18</b>
<b>5. GO A BIT FURTHER: A BUSINESS RESILIENCE PREPAREDNESS PLAN</b>	<b>22</b>
5.1 Business resilience in supply chain and technology	23
5.2 Another step further: disambiguating resilience and antifragility	26
5.3 WHAT'S NEXT	27
<b>6. DIGITAL SOURCES</b>	<b>29</b>

# 1. Introduction

This deliverable is part of WP2 that aims at creating the best conditions for the Silicon Eurocluster partners as well as the EU electronics value chains to implement digital technologies and greener solutions, stay resilient and well-connected to face possible emergencies or economic crises.

According to the Euroclusters purposes, the aim of the document is to help SMEs *with common resilience, green or digital transformation challenges to enable them to identify and implement the most competitive solutions*. In fact, this deliverable offers an agile and preliminary overview of main literature and methods for companies to understand, organize, manage and safeguard their business, including some interactive tools (matrix and videos).



The Pan EU Clusters SWOT analysis to identify clusters' gaps, promoting cross-clusters learning", explicated in the Silicon Eurocluster proposal, will be briefly included in the D2.3 – 2d Resilience preparedness/business continuity plans in the industrial ecosystem/s foreseen at M12.

## 2. What is a SWOT analysis and what its potential benefit?

A SWOT analysis is used to strategically identify areas of improvement or competitive advantages for a company. Using this information, a company can make smarter decisions to preserve what it does well, capitalize on its strengths, mitigate risk regarding weaknesses, and plan for events that may adversely affect the company in the future.

A SWOT analysis facilitates a realistic, fact-based, **data-driven look** at the strengths and weaknesses of an organization, initiatives, or within its industry, focusing on real-life contexts and information.

Companies should use it as a guide (a kind of beacon) to orient its activities and not necessarily as a prescription.

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a **company's competitive position** and to develop **strategic planning, assessing internal and external factors**, as well as current and future potential.



**STRENGTHS** are **internal**, positive parts of your business, that are within your control. yourself:

- What do we do well?
- What do we do better than our competition?
- What unique assets do we have internally (such as knowledge, background, network, reputation or skills) and externally (such as customers, patents, technology or capital)?
- What positive aspects of the business give us a competitive advantage?

**WEAKNESSES** are **internal**, negative factors, that you might need to improve on to be competitive.

- What and where can we improve?
- What do our competitors do better?
- Where are the gaps in our assets and resources (such as knowledge, cash or equipment)?
- Is the thing that sets us apart from our competition obvious?
- How can we improve business processes?

**OPPORTUNITIES** are **external**, positive factors that may give a competitive advantage and contribute to success.

- What trends can we use to our advantage to increase use of our product or service?
- Are there any changes or events that might positively impact us (such as consumer behaviour, regulation, policies or new technology)?
- Has anything changed in the market that creates opportunity for us?

- Do the public like us?

**THREATS** are **external** factors beyond your control that may put your business at risk. Consider putting in place contingency plans for dealing with them if they occur.

- What factors beyond our control could place us at risk?
- What potential competitors may enter the market?
- Are our resource and material supply unstable or insecure?
- Are there any changes or events that might negatively impact us (such as consumer behaviour, regulation, policies or new technology)?

A SWOT analysis pulls internal information (strengths of weaknesses of the specific company) as well as external forces that may have uncontrollable impacts to decisions (opportunities and threats).

Developing a SWOT analysis helps companies look at their business from different directions, providing **assessing its capabilities/weakness** to define a **business strategy**, **prioritising areas for business** and related strategic **actions to achieve** business goals.

SWOT benefits

- It makes complex problems more manageable, paring down all ideas and **ranking bullets** by importance, potentially overwhelming problem into a more digestible report.
- It covers both the **internal factors** a company can manage and the **external factors** that may be more difficult to control.
- It is a **versatile tool** that has many applications that can be applied to almost every business question.
- A **SWOT analysis** may not be overly costly to prepare and many different staff members can contribute to its preparation without training or external consulting.

## 2.1 How do you write a good swot analysis?

- Create a list of questions to answer for each element, as a guide for completing the SWOT analysis and creating a balanced list.
- The SWOT framework can be constructed in list format, as free text, or, most commonly, as a 4-cell table, with quadrants dedicated to each element.
- Strengths and weaknesses are listed first, followed by opportunities and threats.

A SWOT analysis is a great way to guide **business-strategy meetings, including everyone in the discussion** on the company's core strengths and weaknesses, define the opportunities and threats, and brainstorm ideas. It can be used for the overall business strategy sessions or for a specific segment such as marketing, production, or sales.

SWOT helps them visualise the firm's relative advantages and disadvantages to better understand where and how the organization should allocate resources, either towards growth or risk reduction initiatives, briefly to assess the business more completely. Moreover, a SWOT analysis is generally used in conjunction with other assessment frameworks, like Porter's 5-Forces and PESTEL scheme.

## 2.2 Analysis of the industry: the porter's 5 forces model

Michael Porter discussed this in his influential 1985 book *Competitive Advantage* in which he first introduced the concept of the value chain, as a set of activities that an organization carries out to create value for its customers. He set up a **5 forces model** identifying **five competitive forces that shape**

**every industry**, helping companies to determine their weaknesses and strengths and to consequently define corporate strategy. The 5 forces are:



- **Competition in the industry:** it refers to the number of competitors and the number of equivalent products and services they offer, the lesser the power of a company.
- **Potential of new entrants into the industry:** a company's power is also affected by the force of new entrants into its market. An industry with strong barriers to entry is ideal for existing to charge higher prices and negotiate better terms.
- **Power of customers** to drive prices lower, depending on how many buyers or customers a company has, how significant each customer is, and how much it would cost a company to find new customers or markets for its output. A company that has many, smaller, independent customers will have an easier time charging higher prices to increase profitability.
- **Power of suppliers:** suppliers can influence the cost of inputs: they depend on number of suppliers of key inputs of a good or service, how unique these inputs are, and how much it would cost a company to switch to another supplier. The fewer suppliers to an industry, the more a company would depend on a supplier.
- **Threat of substitute products** or services that can be used in place of a company's ones. Companies that produce goods or services for which there are no close substitutes will have more power to increase prices and lock in favorable terms.

Moreover, Porter proposed a **general-purpose value chain** that companies can use to examine all of their activities and see how they're connected. The way in which **value chain activities are performed determines costs and affects profits**, so this tool can help companies understand the sources of their value: **VALUE CREATED AND CAPTURED – COST OF CREATING THAT VALUE = MARGIN.**

Porter's Value Chain focuses on systems, and how inputs are changed into the outputs purchased by consumers, and he divided them into primary and support activities. The five key (primary) activities that generate higher profits include inbound logistics, operations, outbound logistics, marketing and sales, and services. The goal of this set of activities is to create **value that exceeds the cost of conducting that activity**, and therefore generating a higher profit.

**PRIMARY ACTIVITIES** linked to manufacturing, sale and transportation of the product to the customer:

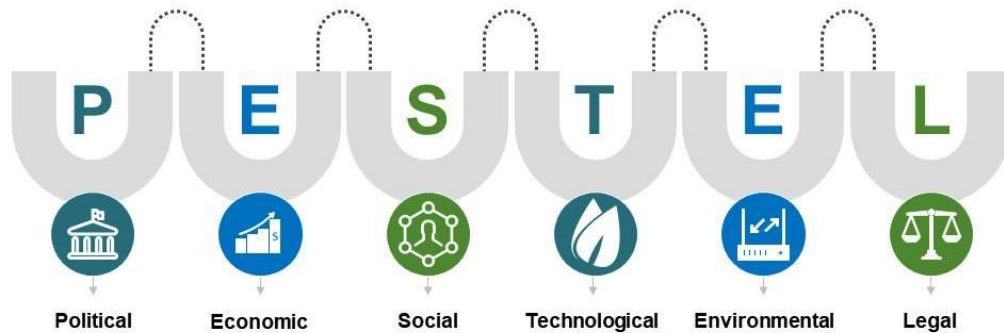
1. Inbound logistics: activities related to the receipt and handling of raw material inventory.
2. Operations: equipment, assemblies, product packaging, maintenance of facilities and other value creation activities- that is, activities that transform raw materials into finished products.
3. Outbound logistics: activities related to the delivery of products or services to the customer, including collection, storage and distribution systems.
4. Marketing and sales: activities that allow customers to get to know the product or service and make the purchase.



5. Services: activities that increase the customer's perception of value of products or services after purchasing (i.e. installation, support, training and update services, among others).

There are **activities that support the primary activities** to provide an advantage over competitors.

1. Company infrastructure to maintain its operations, as legal, financial, accounting and quality management sectors.
2. Human Resources Management, to the hiring, training, retention and remuneration of the workforce.



3. Technology development supporting the value chain, such as research and development, process automation, design etc.
4. Purchasing, involving the acquisition of the necessary resources (raw materials, services, machinery and office supplies, among others). This also includes finding suppliers and negotiating the best prices.

As we said, a SWOT analysis is generally used in conjunction with other assessment frameworks, like Porter's 5-Forces and the PESTEL scheme: this one includes external factors.

## 2.3 The PESTEL analysis: external factors can be risks

PESTEL factors is a scheme listing external factors to be taking into account by companies to set up a business continuity plan(strategy). Factors/Risks can be divided into:

PESTEL analyses SWOT external threats, giving a bird's eye view from many different angles that one wants to check and keep a track of while contemplating a certain idea/plan. Moreover, this concept is used as a tool by companies to track the environment they're operating in or are planning to launch a new project/product/service, etc.

- What is the political situation of the country and how can it affect the industry?
- What are the prevalent economic factors?
- How much importance does culture have in the market and what are its determinants?
- What technological innovations are likely to pop up and affect the market structure?
- Are there any current legislations that regulate the industry or can there be any change in the legislations for the industry?
- What are the environmental concerns for the industry?

The importance of each factor may be different to different kinds of industries, but it is imperative to any strategy a company wants to develop that they conduct the **PESTEL analysis** as it forms a much more comprehensive version of the SWOT analysis.

- ✓ **Political factors** determine the extent to which a government may influence the economy or a certain industry such as tax policies, Fiscal policy, trade tariffs, etc.
- ✓ **Economic factors** that directly impact a company and have resonating long term effects, i.e. the inflation rate, interest rates, foreign exchange rates, economic growth patterns, foreign direct

investment...

- ✓ **Social factors** can affect companies' performance: cultural trends, demographics, population analytics, consumer activism and corporate social responsibility initiatives.
- ✓ **Technological factors** (such as innovations) may affect the operations of the industry and the market favorably or unfavorably. This refers to automation, research and development, and the amount of technological awareness that a market possesses. But also, the proliferation of mobile phones of workers or Artificial intelligence need to build risk strategies to mitigate potential threats. Moreover, this also can include *competitive risks with medium-term impact: in fact*, the emergence of disruptive technologies (such as the internet, smartphones, and bar codes) and radical strategic moves by industry players (i.e. Apple into the mobile phone and consumer electronics industries).
- ✓ **Environmental factors** include all those that influence or are determined by the surrounding environment. For examples climate, weather, geographical location, global changes in climate, environmental offsets, etc. Examples include natural disasters such as the 2010 Icelandic volcano eruption that closed European airspace for a week and economic disasters or the Japanese earthquake and tsunami in 2011.
- ✓ **Legal factors** have both external and internal sides. There are certain laws that affect the business environment in a certain country while there are certain policies that companies maintain for themselves. Legal analysis considers both of these angles and then charts out the strategies in light of these legislations. For example, consumer laws, safety standards, labour laws, etc.

The methods and the schemes described contribute to confirm how business has an “**ontological complexity**” referring to the formation of a large, **interconnected network of elements**, data, technologies, products or services, people within an organization, markets, geopolitical situations, that all together create a **dynamic and uncertain environment**.

## 2.4 The VUCA methodology to face globalisation

VUCA is an acronym standing for **volatility, uncertainty, complexity and ambiguity**, that is making a **situation or a condition** difficult to analyse, respond to or plan for. Understanding how to mitigate these qualities can greatly improve the strategic abilities of a leader and lead to better outcomes.

The acronym VUCA was first used in the U.S. Army War College in 1987 to describe the conditions following the end of the Cold War and the conflict in Afghanistan at that time. The proper use of VUCA is to apply it to an uncertain situation to help quantify risks and vulnerabilities and create mitigation strategies.

**Volatility:** Volatility is the trait of being open to frequent, quick, and considerable change. Small events may trigger large changes. Commodity prices, for instance, may increase or decrease significantly over a brief period of time in a volatile market, and a trend's direction may abruptly change.

- ✓ What are the highest and lowest possible values that we can expect?
- ✓ How fast can these values change?
- ✓ What amount of change can we absorb before it negatively impacts us?

**Uncertainty:** When events and results are unpredictable, uncertainty occurs. The relationship between the causes and effects is unclear; therefore, prior knowledge may not be relevant in this case. The future course of events is uncertain; in a volatile market, for instance, it is difficult to predict whether and by how much prices will increase or decrease.

- ✓ What can change?
- ✓ What are potential signs of change?
- ✓ Will we know when things change?
- ✓ How fast can we respond to a change?

**Complexity:** Complexity includes a wide range of problems and elements, some of which may be intricately interwoven. It's challenging to comprehend how things and people relate to one another. Unintentional alterations to other objects could result from a change in one area in the future. Many layers

hide cause and effect, and it is unclear which elements are crucial to the decision-making process. For instance, in a complicated market, gas price variations impact the costs of other unrelated goods.

- ✓ How well do we understand the structures involved?
- ✓ How are these items interconnected?
- ✓ What is our ability to stop a chain reaction or cascading failure?

**Ambiguity:** Lack of clarity and difficulty understanding the situation's specifics shape ambiguity. It's possible to mistake or misinterpret information. When circumstances are unclear, all the facts are murky. All parties engaged might not be aware of the objective or desired result. For instance, not all information is available in a murky market, and hidden forces can influence pricing.

- ✓ What is our visibility into the internal and external factors?
- ✓ What is the possibility for misunderstanding and confusion?
- ✓ How can directions be issued more clearly?
- ✓ What signifies that more information is needed before making a decision?

Technology is one of the great sectors in which apply VUCA methodology: it is a rapidly changing and advancing field where experts may not agree or have differing opinions. Global supply chains and interconnected systems are complex and difficult to untangle. Disruptive technologies are introduced daily. Therefore, applying the principles of VUCA to technology structure can offer invaluable insights.



## TAKE AWAY TOOLS ON BUSINESS STRATEGY-PERFORMANCES

- ✓ **Hax Delta Model** strategic framework with a pro-consumer approach (**consumer-centric strategy**) for business strategies in an organization. Hax Delta Model in a nutshell [here](#).
- ✓ **The industry life cycle**, to understand the business operates in a growing, mature, or declining industry and which are opportunities and threats and the way to perform. ILC in a nutshell [here](#)
- ✓ **Ansoff's Matrix** helping conceptualize the level of risk associated with different growth strategies. Ansoff in a nutshell [here](#)
- ✓ **Its yearly trends and relative performance** of a company's financial statements to reveal insights regarding profitability, liquidity, operational efficiency, and solvency. The tool is a **financial ratio analysis** marking how a company is performing over time, while comparing a company to another within the same industry or sector. Ratio analysis in a nutshell [here](#)
- ✓ **SWOT analysis template** [here](#)
- ✓ **SWOT video** [here](#)

### 3. How to mitigate vulnerabilities: the risk management

Risk management allows businesses to act proactively in **mitigating vulnerabilities** before any major damage is incurred. It is an important business practice that helps businesses identify, evaluate, track, and improve the risk mitigation (corrective actions) process in the business environment.

Business continuity plan (BCP) explored in the further chapter is a sub-category of risk management, playing an important role in helping an organization get back up and running after a disruption. From cyberattacks to fires and floods, all organizations are vulnerable to unforeseen disruptions.

**Risks can generally be classified by their cause or effect, and the origins of a risk** (internal or external) will vary considerably. However, despite the differences, the occurrence of a destructive event will trigger a common response from a business, with many activities being identical irrespective of the nature and origin of the event. Certain risks (“killer risks”) – which often have a catastrophic effect on a business or its staff – can be difficult, or even impossible, to insure against. Such risks might affect, for instance:

- The protection of human life and health
- The ability to meet the requirements of customers
- The reputation of the business
- The preservation of key operational resources, such as the IT network

#### 3.1 Classifying and measure risks to set up strategies:

**PREVENTABLE RISKS**, arising from **within the organization**, are controllable and ought to be eliminated or avoided. Examples are the risks from employees’ and managers’ unauthorized, unethical, or inappropriate actions and the risks from breakdowns in routine operational processes. To be sure, companies should have a zone of tolerance for defects or errors that would not cause severe damage to the enterprise and for which achieving complete avoidance would be too costly. This risk category is best managed through active prevention: monitoring operational processes and guiding people’s behaviours and decisions toward desired norms.

**STRATEGY RISKS** are those a **company voluntarily assumes to generate superior returns** from its strategy. A strategy with high expected returns generally requires the company to take on significant risks, and managing those risks is a key driver in capturing the potential gains. For example, BP accepted the high risks of drilling several miles below the surface of the Gulf of Mexico because of the high value of the oil and gas it hoped to extract. Strategy risks need a risk-management system designed to reduce the probability that the assumed risks actually materialise and to improve the company’s ability to manage or contain the risk events should they occur.

Risks can be also included in a **quantitative risk assessment** referring to any data point (i.e. money), metrics, or interest rates and qualitative **risk assessment**, not quantifiable as the risk of climate change that many businesses are now focusing on cannot be quantified as a whole, only different aspects of it can be quantified.

		1. Preventable risks	2. Strategy risks	3. External risks
<b>DESCRIPTION OF CATEGORY</b>	<b>OF</b>	Risks arising from within the company that generate no strategic benefits	Risks taken for superior strategic returns	External, uncontrollable risks
<b>RISK MITIGATION OBJECTIVE</b>		Avoid or eliminate occurrence cost-effectively	Reduce likelihood and impact cost-effectively	Reduce impact cost-effectively should risk event occur

<b>CONTROL MODEL</b>	Integrated culture-and-compliance model: Develop mission statement; values and belief systems; rules and boundary systems; standard operating procedures; internal controls and internal audit	Interactive discussions about risks to strategic objectives, drawing on tools such as: Maps of likelihood and impact of identified risks Key risk indicator (KRI) scorecards Resource allocation to mitigate critical risk events	“Envisioning” risks through: Tail-risk assessments and stress testing Scenario planning War-gaming
<b>ROLE OF RISK-MANAGEMENT STAFF FUNCTION</b>	Coordinates, oversees, and revises specific risk controls with internal audit function	Runs risk workshops and risk review meetings Helps develop portfolio of risk initiatives and their funding Acts as devil’s advocates	Runs stress-testing, scenario-planning, and war-gaming exercises with management team Acts as devil’s advocates
<b>RELATIONSHIP OF THE RISK-MANAGEMENT FUNCTION TO BUSINESS UNITS</b>	Acts as independent overseers	Acts as independent facilitators, independent experts, or embedded experts	Complements strategy team or serves as independent facilitators of “envisioning” exercises

**EXTERNAL RISKS (PESTEL MODEL)** arise from **events outside the company and are beyond its influence or control**. Sources of these risks include natural and political disasters and major macroeconomic shifts. Because companies cannot prevent such events from occurring, their management must focus on identification (they tend to be obvious in hindsight) and mitigation of their impact.

### 3.2 How to quantify risks and set up a preparedness business & resilience strategy?

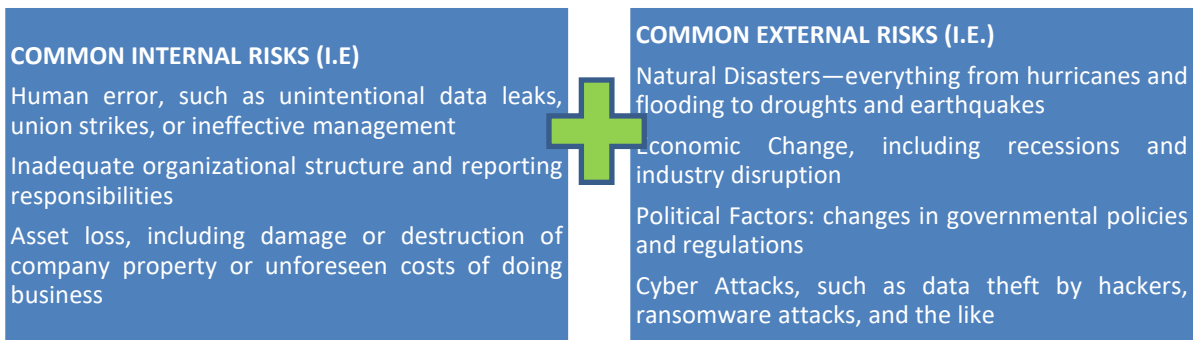
The Risk-based Scorecard is an approach to **calculate and record company’s risk level (for example towards some customers)**, accorded to the risk-based approach, policies and procedures: it allows companies to gather and structure the relevant information, find data gaps and generate a risk score. It contains all data an organisation has identified as important to their risk assessment, **turning this data into a risk score** (that is measurable).

It can be sensitive to any data point known about the customer and is easily tailored to your organisation. Regular re-scoring of a customer gives you a dynamic risk understanding – *which tells how risky a particular customer is at that moment in time*. This is done in the form of a risk score, which in turn is classified according to a company-defined customer risk level: usually high, medium or low risk.

Scorecards should **capture additional risk factors** like source of funds, products that will be used, employment, nature of the relationship and they can also record anticipated transactional behaviour, such as number of monthly transactions, total value and approved currencies. This is invaluable when conducting future reviews to see if the customer did behave as expected.

Scorecards can be tailored to the type of entity they are scoring, whether that be, for example, a financial institution, corporate entity, government entity, individual, etc.

## RISK SCORECARD CALCULATION: INTERNAL + EXTERNAL RISKS

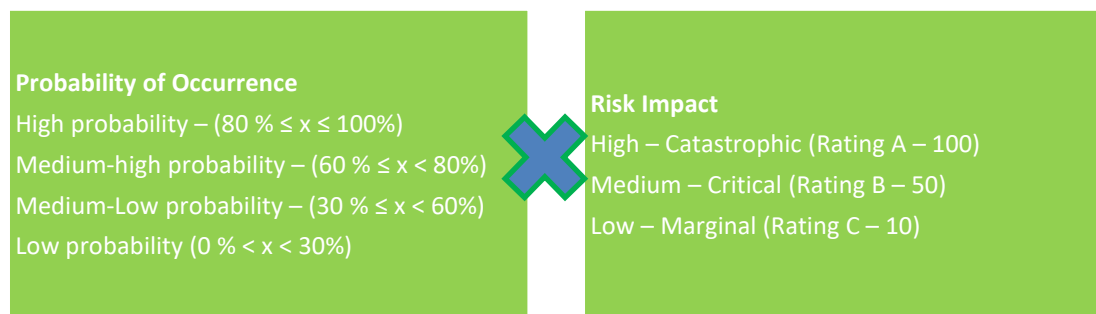


The risk is linked to its identification and its “occurrence” after the analysis

**Risk Identification:** Identifying potential risks is paramount to a successful project. Risk identification should not only be performed at the earliest stages of project development, but it should also be reassessed throughout the project life cycle: risk identification is one of the key topics in the regular project status and reporting meetings. Some risks may be readily apparent to the project team — known risks; others will take more rigor to uncover but are still predictable.

**Risk Analysis** Once a risk has been identified, analysis helps you understand the threat it poses to your project or organization. This step explores the risk’s potential qualitative and quantitative impacts — which will help in creating processes to mitigate negative consequences. In other words, risk analysis is about calculating probability and likely outcomes.

## RISK= PROBABILITY OF EVENT X MAGNITUDE OF LOSS



### Risk Score

The result is the quantifiable number that allows key personnel to quickly and confidently make decisions regarding risks.





Likelihood scale			Impact scale			Level of risk		
Level	Likelihood	Description	Level	Impact	Description	Rating	Description	Action
4	Very high	Happens more than once a year	4	Severe	Business to stop trading or face major loss	12–16	Severe	Immediate corrective action
3	High	Happens about once a year	3	High	Major impact with large financial loss	8–12	High	Action within 1 month
2	Medium	Happens every 10 years	2	Moderate	Moderate impact with some loss	4–8	Moderate	Action within 3 months
1	Low	Has only happened once	1	Low	Insignificant impact with minimal financial loss	1–4	Low	Long term corrective action

[www.business.qld.gov.au](http://www.business.qld.gov.au)

8



Figure 2 [www.business.qld.gov.au](http://www.business.qld.gov.au) Risk Core Card

### 3.3 Risk management and decisions: the role of cognitive bias

We already referred to the VUCA methodology and the internal/external factors to underline the complexity of the business. Another relevant element to be taken into account is the **role of decision makers** within a company, usually managers. When undertaking risk identification, assessments, or attending risk committee meetings, there is the potential that the **biases influencing the outcome** to conclude without considering alternatives. This could lead to the failure of identification of key risks. Whenever we make decisions there are a **number of biases that can come into play**. Being able to recognise the drivers for these biases is what will help to identify them and ensure that they can be challenged where necessary so that informed choices and **decisions can be made in regard to seeking risks and opportunities**.

Here the main bias to be taken into account: according to the [Cognitive Bias Codex](#), there are an estimated 180 cognitive biases (this list is frequently updated.) Created by John Manoogian III and Buster Benson, this codex is a useful tool for visually representing all of the known biases that exist to date. The biases are arranged in a circle and divided in four quadrants.

Each quadrant is dedicated to a specific group of cognitive biases:

1. *What should we remember?*  
Biases that affect our memory for people, events, and information
2. *Too much information*  
Biases that affect how we perceive certain events and people
3. *Not enough meaning*  
Biases that we use when we have too little information and need to fill in the gaps
4. *Need to act fast*  
Biases that affect how we make decisions

- ✓ **Confirmation bias:** this is at the root of unconscious bias. We want other people to approve of our views and opinions, and so we seek out others who will “confirm” our position. In the context of risk identification, we may only seek the views of people in our organisation who will tell us what we want or expect to hear. By doing this we may fail to capture the full range of risks facing the organisation.
- ✓ **Groupthink bias** When we know that a large number of our peers or colleagues feel a certain way, we are more likely to align our opinions with theirs. Many biases are rooted in fear; of being excluded or being perceived as different. Often, junior or more recently employed staff will agree with their seniors, nervous that their idea is a bad one. For this reason, conducting risk identification in workshops alone could be a risk in itself as the output may be a result of groupthink.
- ✓ **Availability bias** Naturally, we are most likely to flag up risks that relate to what is at the forefront of our mind. In risk identification, this form of bias is most commonly related to one’s workload or what’s in the press at the time. For example, if there are a series of high-profile cyber-attacks in the news, a board member may identify it as being high up on the risk agenda. However, for that particular organisation, other risks may be a greater, albeit lower in their consciousness. If you are not directly involved in discussions on the issue, significant risks may be missed out, or ignored as part of the identification process.
- ✓ **Anchoring bias** Our decisions are often informed by the first thing we see. An everyday example of this is when we see a higher price for a certain brand in a shop, making all the other brands seem very cheap, even if they are not. We tend not to question the first price or piece of information we receive and we “anchor” our perception to that original point. In risk identification, the way a question is introduced or how it is phrased may create a subconscious anchoring bias in the respondent’s mind.
- ✓ **Status quo bias** From a behavioural standpoint, we tend not to embrace change easily. Our brains prefer to make quick and easy decisions. We like things to stay the same. And from a risk perspective, this means that we tend not to question what is already in existence on our risk registers. Just like anchoring, we assume that because it’s already there, it must be for a good reason. We need to challenge this approach so that we can ensure all relevant risks are surfaced and addressed.
- ✓ **Hindsight bias** This form of bias informs our decision-making more than you may think. When assessing why something may have gone wrong, we often feel that this issue was avoidable all along. When decisions are made based on hindsight bias, a blame culture can be created. Further, hindsight bias can result in changes in processes that are not only unnecessary, but potentially harmful to the business.
- ✓ **Affective heuristic** Your mood influences your ability to objectively evaluate anything! When it comes to risks, this could mean that you overestimate the impact of a risk on a bad day or (more likely) underestimate the impact of a risk on a good day. The key problem here is that on different days you will apply different risk factors and will focus efforts on the wrong areas.
- ✓ **Risk Framing** It has been demonstrated that people will prefer to take a higher risk to avoid loss and a lower risk to preserve gain. Even when the numbers don’t make sense. The net result is that you can respond to risks with the wrong reasoning.
- ✓ **Normalcy Bias** (or the Black Swan Effect) If something has never happened before, we are much less likely to accept that it will happen. Black Swans were assumed to not exist because no-one had seen one but that didn’t seem to bother the swans. We see Black Swan events all the time and are surprised by them. The Financial Crash was one, Coronavirus another. In hindsight these were perfectly predictable events that we should have been expecting (at some point).
- ✓ **Optimistic Bias** Humans are generally optimistic which enables us to confront difficult situations. However, this can also cause us to avoid risks where we don’t want to face them. “It will be alright on the night”. This will cause us to underestimate the impact (or overestimate our ability to cope with the risk should it materialise).
- ✓ **Current Moment Bias** This is about the apparent priority of now over later. Typically, this is the



gain of doing nothing now compared to the future value of doing something. This makes people reluctant to spend now to respond to a risk that is a long time away, even if the probability adjusted cost of the risk is higher than the mitigating action.

- ✓ **Sunk cost bias** Subconsciously, we will put more emphasis on preserving something we have invested in rather than preserving something because it has value.

Effective risk-management processes must counteract those biases. Risk mitigation is painful, not a natural act for humans to perform: the biggest challenge in establishing a new risk culture is to get project teams to feel comfortable thinking and talking about what could go wrong with their excellent designs.

## TAKE AWAY TOOLS

- ✓ Short video introduction to get the main instructions to build your **risk score card** [here](#)
- ✓ Select & Download your **risk matrix** scorecard(s) [here](#)
- ✓ Discover more on **risk management** main topics [here](#)
- ✓ Have an overview of the main **bias in business** and watch the TEDx videos on them [here](#)
- ✓ Google's unbiasing performance **review checklists** used these during the promotion process to help managers make decisions & guide conversations with their teams [here](#)



## 4. After the risk assessment: business continuity plan to face and challenges

While **risk management focuses on mitigating problems** from the outside, **business continuity plans** outline what a company should do in case they are faced with the worst possible outcome, that is **be prepared** for any scenario that may come their way.

Once companies have an **awareness of the types of risks** and threats they may be vulnerable to, they can begin to form an effective plan. A strong plan will also use the output of **business impact analysis to reveal the possible consequences of disruption on business**. This will enable to anticipate its cost, the effect it could have on essential business functions and the time needed to recover.

A comprehensive business continuity plan will take each risk identified in the business impact analysis and develop an **appropriate response strategy to either minimise it or prevent it altogether**: timescales and resources, roles and responsibilities, clear communication and training: raising awareness of the business continuity plan among the wider staff will also help them to understand its role in responding to disruptions. Many companies run regular awareness training sessions and include business continuity as a key topic during new staff inductions. This training can then improve the resilience of the company overall.

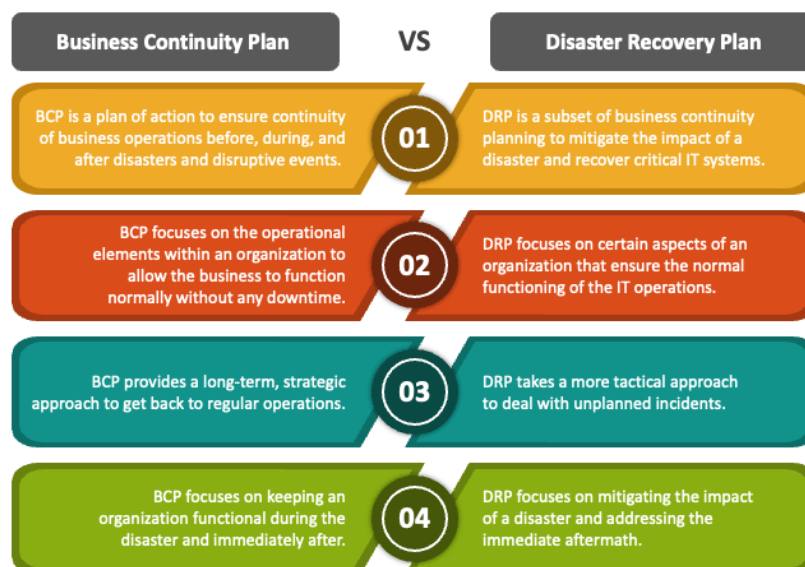


Figure 3 Business continuity VS disaster recovery <https://www.collidu.com/presentation-business-continuity-and-disaster-recovery>

Moreover, a business continuity plan (BCP) is more comprehensive than a **disaster recovery plan (DR)** including detailed instructions on how to respond to unplanned incidents such as natural disasters, power outages, **cyber-attacks**: a BCP is an overarching **strategy for operating in disaster scenarios** or recovering from a major disruption, while a disaster recovery (DR) plan refers **more specifically to the IT processes and tools** you can rely on to retain or restore access to mission-critical data, applications, and services in these scenarios.

As we underlined, a Business Continuity Plan (BCP) is a detailed **strategy** and set of systems for ensuring an organization's ability **to prevent or rapidly recover from a significant disruption to its operations**. Anatomy of a business continuity plan

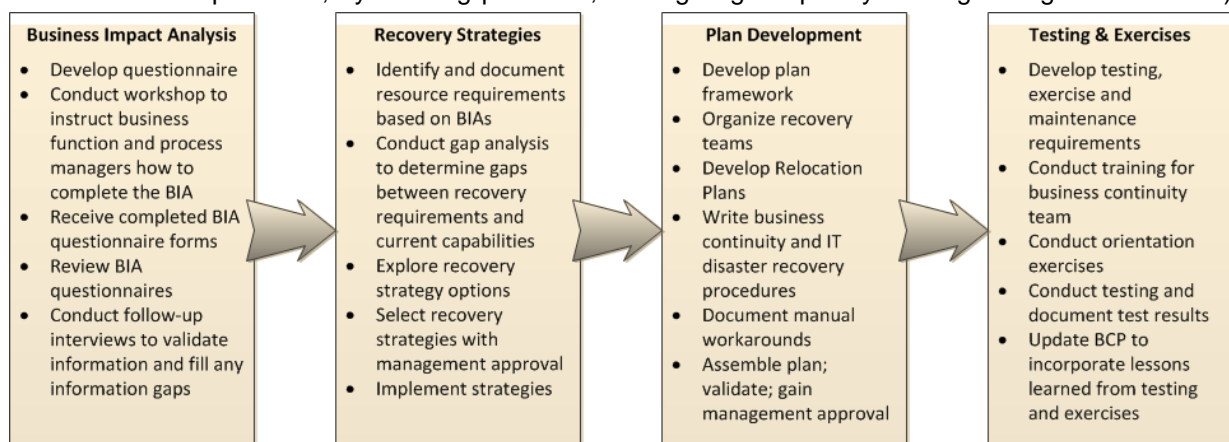
- ✓ Identify the scope of the plan.
- ✓ Identify key business areas.
- ✓ Identify critical functions.
- ✓ Identify dependencies between various business areas and functions.

- ✓ Determine acceptable downtime for each critical function.
- ✓ Create a plan to maintain operations.

The plan is essentially a **playbook for how any type of organization** that will continue its day-to-day business during a disaster scenario or otherwise abnormal conditions, defined by SWOT analysis as threads. BCP has a key role because **risks can be managed, but they can't be eliminated**.

The purpose of this business continuity plan is to ensure the continuation of the business during and following any critical incident that results in disruption to normal operation. There are many frameworks for creating an effective business continuity plan and most of them cover 4 phases:

- **IMPACT ANALYSIS** for identifying and evaluate the various functions of company's business and its operations to determine how those different functions will be affected by a disaster. It usually entails **prioritising different areas** or departments in terms of how important are for operations and their vulnerabilities (Risk assessment and/or threat modelling and Business impact analysis).
- **RECOVERY STRATEGIES** After conducting a business impact analysis, a company should have an understanding of how business will need to respond to crises when they arise in order to come out on top. Recovery strategy includes a) **Proactive** strategies to prevent crises, b) **Reactive** strategies to immediately respond to crises, c) Reactive strategies for **long-term recovery** from the crises.
- **PLANNING** for continuing to operate in a disaster, or rapidly recovering from a disruption to normal operations, by defining protocols, strategizing temporary staffing changes or needs c)



implementing IT disaster recovery tools, setting up a continuity or crisis management team (Process and workflow development and dependency mapping).

- **TRAINING AND TESTING** regularly to ensure the plan will work if needed, educating employees on their roles and responsibilities in these scenarios and conducting trials of various elements of the plan. This methodology for resilience planning examines critical business functions and assesses the real costs—whether financial or quantified in a different unit of measurement—of disruptions to those services (testing and optimization);

## KEY FEATURES OF A BUSINESS CONTINUITY PLAN

- **People:** A BCP will clearly define roles and responsibilities, not just for the crisis management leadership team, responsible for implementing different pieces of the plan in a disaster scenario.

- **Technology** plays a key role in ensuring critical data, applications and services remain available or are quickly restored after an interruption (i.e. Data backup and recovery tools, Cloud computing infrastructure and services, Remote work platforms).
- **Service Delivery:** A BCP should also describe which services are most critical and how they will continue to be delivered to customers, employees, partners, the public and other stakeholders.
- **Health & Safety:** Finally, a strong business continuity program will include criteria and guidelines for ensuring the health and safety of all people involved.

**Communication** is vital during business disruptions. Effective communication across your business can reassure team members and give them confidence that the organisation is taking effective steps to respond and recover. Organizations also use business continuity management applications as part of their longer-term schedule for regularly reviewing their BCP and making updates as needed. Moreover, the app can be a backbone for testing different components of the BCP to identify opportunities for improvement during “business as usual” conditions, rather than during an actual crisis.

The BCP is rooted on the PDCA lifecycle (Plan-Do-Check-Act) is a four-step problem-solving iterative technique used to **improve business processes**. Originally developed by American physicist Walter A. Shewhart during the 1920s, the cycle draws its inspiration from the continuous evaluation of management practices and management’s willingness to adopt and disregard unsupported ideas.

The Deming PDCA cycle has four stages:

- **PLAN:** determine goals for a process and needed changes to achieve them. It should reflect the organization’s mission and values, and clearly indicate the best way to attain them.
- **DO:** implement the changes, where the plan is executed. This stage can be divided into three sub-segments, including A) training of all personnel involved in the project, B) the actual process of doing the work, and 3) recording insights, or data, for future evaluation.
- **CHECK:** evaluate the results in terms of performance, by checking the implementation of the project’s objectives are being met and reviewing the project including the successes and failures and which mitigation actions can be made.
- **ACT:** standardise and stabilise the change or begin the cycle again, depending on the results, taking corrective actions and makes the methodology ideal for continuous improvement effort.



The method was popularised by quality control pioneer Dr. W. Edwards Deming in the 1950s who realised the PDCA Cycle to improve production processes in the USA during World War II.

*In the 1950s, Deming successfully introduced the PDCA also in Japan, heavily related to Japanese*

*kaizen* philosophy, and its concepts of product quality, innovation, and learning-by-doing over the entire life cycle of a product.

Kaizen, which means "change for the better" or "continuous improvement" through small, incremental changes, as using new systems, eliminating waste, or implementing just-in-time delivery.

The kaizen 5 five principles lead to three major outcomes: elimination of waste (also referred to as economic efficiency), good housekeeping, and standardization. In particular, *kaizen* waste reduction and the efficiency is led by the **just-in-time strategy (JIT)**, also known as the Toyota Production System (TPS), minimising excess inventory by matching the delivery of raw materials from suppliers with production schedules.



The concept behind PDCA and kaizen is that the **culture of an organization** changes as the **employees learn to be problem solvers and critical thinkers**. The PDCA cycle is a **dynamic** one, **testing** employees' ideas, **adjusts** them, and then implements them if they have potential. The cycle is an **iterative process** that continually tests concepts and promotes improvements.

## TAKE AWAY TOOLS

- ✓ Start your PDCA diagram [here](#)
- ✓ Find your suitable BCP [here](#)
- ✓ How to write a BCP [here](#)
- ✓ Watch the video to set up your BCP [here](#)
- ✓ BCP templates for entrepreneurs (teams, services, suppliers) [here](#) and [here](#)

## 5. Go a bit further: a business resilience preparedness plan

As defined by Merriam-Webster dictionary, re-sil-i-ence (ri-'zil-yən(t)s) is the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress. We can define resilience of the material to be the **amount of energy the material can absorb and still return to its original state**.

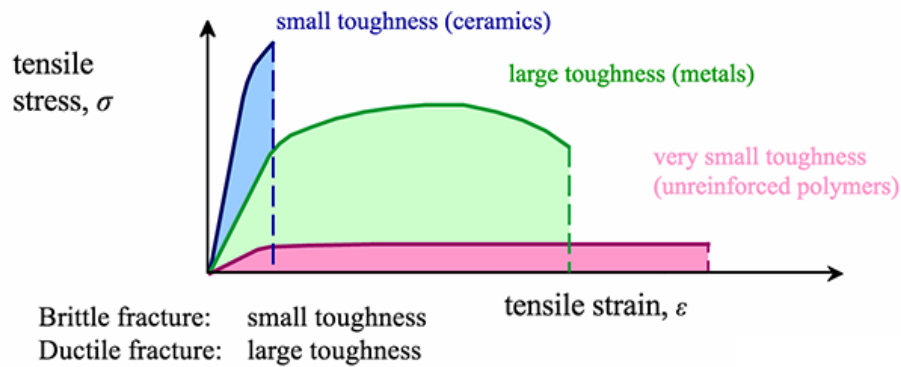


Figure 4 resilience formula

Transposing this approach in organisations, the ISO International Standardisation of Organisations defined *organisational resilience* is the ability of an organization to absorb and adapt in a changing environment to enable it to deliver its objectives and to survive and prosper ([ISO 22316:2017](#)).

Resilience as the ability of an organization to **anticipate**, **prepare** for, **respond** to, and **adapt** to both incremental changes and **sudden disruptions** from an external perspective.

For a business, it means that when disruption occurs, companies have **mechanisms in place to absorb the hit** without significant impairment to their business operations. Essentially *business resilience* is more a strategic risk management approach, which **integrates many disciplines into a single set of integrated processes**, and is **tailored to an individual organisation's requirements**; *business continuity* is a process-driven approach which can be standardised, and which leads an organisation out of a major incident so that it can continue operations; and finally, *crisis management* addresses specific crises (man-made and natural events).

An organization's resilience is the result of the relationships and interactions of attributes and activities and contributions from other management disciplines such as business disaster management (recovery) or BCP which alone are insufficient to lead to resilience.

Consequently, there is no absolute measure or definitive goal and **no single approach to enhance** an organisation's resilience. To sum up, business resilience uses an integrated approach of the other plans; that's why we won't focus on its detailed explanation, but we will offer an overview of the "philosophy behind".

Business resilience builds on the principles of business continuity but extends much further to help enhance an **organization's immune system to be able to tackle challenges**, fend off illness and bounce back more quickly. To have a framework for effective organizational resilience, there are certain principles that need to be adhered to. Resilience requires:

- Behaviour aligned with a shared vision and purpose,
- An up-to-date understanding of an organization's context,

- Ability to absorb, adapt, and effectively respond to change,
- Good governance and management,
- Diversity of skills, leadership, knowledge, and experience,
- Coordination across management disciplines and contributions from technical and scientific areas of expertise,
- Effective risk management,
- Flexibility

To sum up, while business continuity is process centric, resilience is more **strategic in nature**, being a **holistic approach (multi-layered and interconnected)** that is influenced by a unique interaction and combination of strategic and operational factors.

Resilience applied to a company is not to be confused with **business continuity**. The latter, in fact, is **operational in nature** and concerns the ability to make products and services available within a reasonable timeframe at predetermined levels, in the face of complex conditions. Business resilience, on the other hand, concerns the **strategic ability to be ready in the face of difficult scenarios**, while still ensuring **sustainable growth** by reducing risks and managing them. The resilient company formulates hypothetical scenarios, identifies ways to deal with them and restarts when challenged, thanks to dedicated plans.

The starting point of this process is an **analysis of the internal and external environment** to map the risks to which the organization is exposed, the opportunities to be seized to strengthen itself and the actions to be put in place to cope with difficulties. All this takes place at financial, operational, reputational and organizational levels: the entire structure of a company must change in order to build a resilient business model.

## 5.1 Business resilience in supply chain and technology

The volatility in the new reality worldwide, what the polish sociologist Zygmunt Bauman defined *liquid society*: this instability requires companies' capacity to design their **supply chain network to reduce single points of failure**, increasing supply redundancy, and shorten the supply chain. We can summarise that **disruption becomes the new normal**, and the **operational resilience is the new necessity**: the COVID-19 first, the war in Ukraine and the Chinese/Taiwanese/US "skirmishes" in the Asian Area, the climate change, are stress-testing the resilience of organisations across the globe, in rising inflation, energy and semiconductor shortage. Companies should plan **with volatility in mind**.



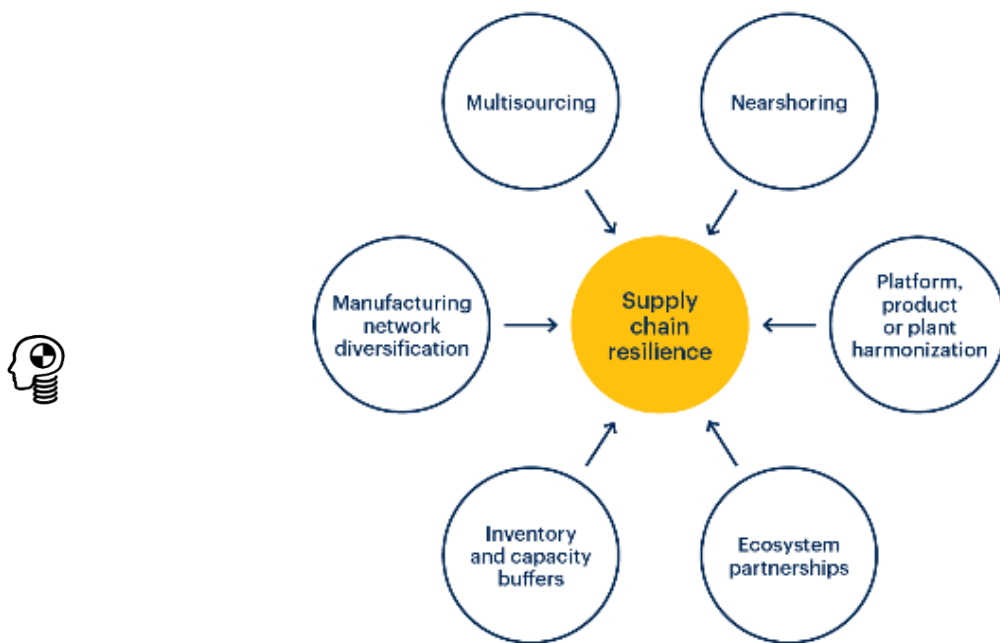


Figure 5 <https://www.gartner.com/smarterwithgartner/6-strategies-for-a-more-resilient-supply-chain>

**Protecting and pivoting supply chains** in the near to medium term, includes creating a nerve center for the supply chain, simulating and planning for extreme disruptions, reevaluating just-in-time strategies, including **assessing the resilience of one's suppliers' suppliers** as part of a full look-through approach.

Recent crises have shown that companies require a more **integrated strategy** than in the past and making sourcing decisions in conjunction with strategy decisions for **buffering** to ensure continues to run smoothly in case of any fluctuations in the production system (having backup **inventory**) and **redundancy** as well as using multiple suppliers (**multi sourcing**) and **diversifying their manufacturing networks**. Beyond multisource, companies want to reduce geographic dependence in their global networks and shorten cycle times for finished products. Regional or local supply chains can be more expensive, but they allow for more control over inventory and move the product closer to the end consumer (**nearshoring**).

Standardizing components across multiple products — particularly those that are not visible or important to the customer — is form of **harmonization** that simplifies sourcing policies and creates opportunities to place higher volumes among multiple suppliers, which in turn enhances resiliency.

Finally, COVID-19 crisis has shown the need to have a **diversified approach for collaborations (creating an ecosystem)** to ensure better preparedness and resilience for **the future**.

To achieve long-term structural resilience, however, organizations should consider measures such as constructing a **“digital twin” of the most critical parts of the supply chain**, creating and testing what-if scenarios, and ring-fencing a small part of the supply team to focus on building long-term resilience instead of day-to-day supply chain issues. Here a couple of suggestions.

**STRESS TEST** Stress-testing helps companies assess major changes in one or two specific variables whose effects would be major and immediate, although the exact timing is not



forecastable. Financial services firms use stress tests to assess, for example, how an event such as the tripling of oil prices, a large swing in exchange or interest rates, or the default of a major institution or sovereign country would affect trading positions and investments.

**SCENARIO PLANNING** Originally developed at Shell Oil in the 1960s, scenario analysis is a systematic process for defining the plausible boundaries of future states of the world. Participants examine political, economic, technological, social, regulatory, and environmental forces and select some number of drivers—typically four—that would have the biggest impact on the company. Some companies explicitly draw on the expertise in their advisory boards to inform them about significant trends, outside the company’s and industry’s day-to-day focus, that should be considered in their scenarios.

**WAR-GAMING** assesses a firm’s vulnerability to disruptive technologies or changes in competitors’ strategies. In a war-game, the company assigns three or four teams the task of devising plausible near-term strategies or actions that existing or potential competitors might adopt during the next one or two years—a shorter time horizon than that of scenario analysis. The teams then meet to examine how clever competitors could attack the company’s strategy. The process helps to overcome the bias of leaders to ignore evidence that runs counter to their current beliefs, including the possibility of actions that competitors might take to disrupt their strategy.



Technology has redefined the way companies do business by enabling them to be more visible, more accessible, and helping them improve their internal/external processes, as well as the services they provide. Focusing on ICT, is undoubted that companies who want to be resilient, invest in **strong, secure, and flexible infrastructure to manage cyberthreats** and avoid technology breakdowns. They maintain and make use of high-quality data in ways that respect privacy and avoid biases, compliant with all regulatory requirements.



The [European Central Bank](#) explicitly talks of **cyber resilience**, referring to *“the ability to protect electronic data and systems from cyberattacks, as well as to resume business operations quickly in case of a successful attack”*.

Cyber resilience can be understood through a lifecycle based on the stages:



Its role is **even more strategic and sensitive** in this uncertain context where geopolitical tensions, notably between the USA and China, are resulting in the **internet splintering** into regional variants and technology stacks. In general, companies need to balance segmenting their networks and **differentiated use of laptops and devices across markets** with maintaining consistent cross-connectivity and user experience.

## 5.2 Another step further: disambiguating resilience and antifragility

Resilience is about recovery after performance degradation, antifragility is defined as a performance gain when exposed to adversity. **Nassim Nicholas Taleb** is mathematician and philosopher who coined in 2012 the “antifragility” term to define this apparent paradox: **antifragility benefits from shocks**.

For instance, during the COVID-19 pandemic, IT services gained a great deal due to people working from home and needing IT solutions. This illustrates that antifragility is distinct from resilience. While systems that suffer performance degradations due to exposure to uncertainty are characterised as fragile, those characterised as **antifragile will benefit, thrive, and grow when exposed to volatility, randomness, disorder, and uncertainty**. Antifragility in organizations denotes a capability to regenerate, prosper, and improve when exposed to unpredictability and volatility activating capabilities to change. Thus, resilience and antifragility are different, and teasing out these differences allows greater insight into the measurement of post-disruption performance. In other words, incorporating an optional upside gain into an umbrella notion of resilience denies the unique features of growth and dismisses it as being secondary. Crucially, stability is also an important feature of growth, meaning that antifragility and resilience belong to the same domain. In effect, they are a duality rather than a dualism, they are interdependent, not separate, so one is not secondary to the other

The easiest way to understand the behaviour of antifragile systems is to compare them with other types of systems. Stress response of fragile, resilient, and antifragile systems.

- A **fragile system** is like glass breaking after a shock.
- A **resilient system** is like rubber recovering after enduring stress.
- An **antifragile system** is like a muscle, becoming stronger after getting torn in the gym.

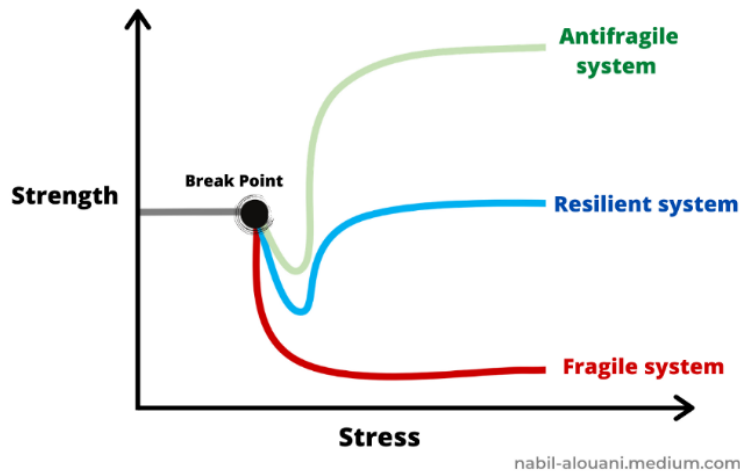


Figure 6 How to respond systems under stress nabil-alouani.medium.com

The **antifragile loves randomness and uncertainty**, which also means — crucially — a love of errors, a **certain class of errors**. Silicon Valley is a place where start-ups are encouraged to fail. Their philosophy is that if you try enough crazy ideas, some of them will stick, because **unless companies learn to fail, they fail to learn**. Antifragility has a singular property of allowing us to **deal with the unknown**, to do things without understanding them — and do them well. When people talk about antifragility, they often mention a particular creature from Greek mythology, the Hydra. It is a serpent-like with several heads. Each time you cut one of those heads, the Hydra regrow two in its place. In other words, the **Hydra benefits from stress and adversity**. It instantly becomes stronger. Thus, it's the perfect illustration of antifragility.



### TAKE AWAY TOOLS

- ✓ Watch out Business Resilience Plan introduction [here](#)
- ✓ Make your organisational resilient assessment [here](#)
- ✓ Watch out resiliency and antifragility approach [here](#)

## 5.3 WHAT'S NEXT

The D.2.3 second SWOT Resilience preparedness/business continuity plan in the industrial ecosystem will go deeper into the industrial ecosystems and the tools, using where possible companies insights coming from the Silicon Eurocluster activities. Moreover, the report will be enriched by some high-level approaches coming from the World Economic Forum.

The overall content of D2.3 will address the following items:

### SWOT OF THE EU COUNTRIES ELECTRONICS INDUSTRY

- General SWOT of the electronics industry in the EU countries based on the same methodology used in a previous SWOT analysis in a Silicon Europe Alliance report in 2013.
- Analysis of the gaps between the countries and how the partners could be complementary / benefit from one another on each link of the value chain
- How EU members could be stronger together to compete against Asia and America

#### **INSIGHTS COMING FROM THE SILICON EUROCLUSTER PARTNERS ECOSYSTEM**

Based on the SWOT and related methods offered by the 1<sup>st</sup> SWOT Resilience plan:

- SWOT analysis coming from the community platform
- SWOT ANALYSIS coming from companies who will receive the funds
- Additional information on risk management coming from Instant poll coming from events

#### **HOW CLUSTERS CAN MANAGE THIS COMPLEXITY**

- Clusters gaps and synergies

## 6. Digital Sources

<https://www.bdc.ca/en/articles-tools/entrepreneur-toolkit/templates-business-guides/business-continuity-guide-templates-entrepreneurs>  
<https://www.bdc.ca/en/articles-tools/entrepreneur-toolkit/templates-business-guides/business-continuity-guide-templates-entrepreneurs>  
<https://www.zerto.com/resources/a-to-zerto/business-resilience/>  
<https://www.antifragility.it/blog/articolo/06/07/2019/35-le-parole-del-management-15-buffer>  
<https://www.matchplat.com/en/how-to-build-business-resilience/>  
<https://www.techtarget.com/searchcio/definition/business-resilience>  
<https://entrepreneurshandbook.co/antifragility-how-to-turn-your-business-into-an-immortal-hydra-77b1054c6b48>  
<https://www.itgovernance.eu/it-it/business-resilience-it>  
<https://www.beondeck.com/post/antifragile-companies>  
<https://onlinelibrary.wiley.com/doi/full/10.1111/ijmr.12289>  
<https://entrepreneurshandbook.co/antifragility-how-to-turn-your-business-into-an-immortal-hydra-77b1054c6b48>  
<https://www.beondeck.com/post/antifragile-companies>  
<https://www.smartsheet.com/all-risk-assessment-matrix-templates-you-need>  
<https://link.springer.com/article/10.1007/s10669-020-09779-8#Fig5>  
<https://www.investopedia.com/terms/p/porter.asp>  
<https://www.alignment.io/80207/BCG-Matrix>  
<https://www.investopedia.com/terms/r/ratioanalysis.asp>  
<https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2>  
<https://asq.org/quality-resources/balanced-scorecard>  
<http://cqcert.co.uk/5s-kaizen-training/>  
<https://embapro.com/frontpage/swotcase/9732-resilience-hardship>  
<https://business.gov.au/planning/business-plans/swot-analysis#:~:text=A%20SWOT%20analysis%20is%20a,fine%20tune%20your%20business%20strategy>  
<https://www.investopedia.com/terms/s/swot.asp>  
<http://www.ibii-us.org/Journals/JMSBI/>  
<https://www.investopedia.com/terms/s/swot.asp#toc-understanding-swot-analysis>  
<https://www.lean.org/lexicon-terms/pdca/>  
<https://www.investopedia.com/terms/p/pdca-cycle.asp>  
<https://zenodo.org/record/3996830#.ZB7pJHbMJPY>  
<https://www.youtube.com/watch?v=a9LWp9y2fMw>  
<https://www.mindtools.com/ajhsltf/porters-value-chain>  
<https://www.ifm.eng.cam.ac.uk/research/dstools/value-chain/>  
<https://www.investopedia.com/ask/answers/050115/what-are-primary-activities-michael-porters-value-chain.asp>  
<https://blog.softexpert.com/en/value-chain/>  
<https://www.investopedia.com/terms/k/kaizen.asp>  
<https://www.investopedia.com/terms/l/lean-six-sigma.asp>  
<https://www.investopedia.com/terms/b/business-continuity-planning.asp>  
<https://www.vmware.com/it/topics/glossary/content/business-continuity-plan.html>  
<https://www.gartner.com/smarterwithgartner/the-future-of-supply-chain-resilient-agile-purpose-driven>  
<https://corporatefinanceinstitute.com/resources/management/ansoff-matrix/>  
<https://corporatefinanceinstitute.com/resources/management/industry-life-cycle/>  
<https://corporatefinanceinstitute.com/resources/management/swot-analysis/>  
<https://corporatefinanceinstitute.com/resources/management/haxs-delta-model/>  
<https://balancedscorecard.org/bsc-basics-overview/#:~:text=The%20Balanced%20Scorecard%20was%20originally,as%20the%20measure%20of%20success.>  
<https://www.agendadigitale.eu/documenti/pmi-gli-strumenti-per-la-trasformazione-digitale-dal-business-continuity-plan-allopin-innovation/>  
<https://www.cybersecurity360.it/soluzioni-aziendali/business-continuity-migliorare-performance-e-resilienza-aziendale-soluzioni-pratiche/> prendere alcuni concetti chiave e tradurli  
[https://www.regione.toscana.it/documents/16409/15122760/ALL\\_A\\_14feb2019.pdf/2c8f52d0-cace-422d-be60-0fb2955e2f1e](https://www.regione.toscana.it/documents/16409/15122760/ALL_A_14feb2019.pdf/2c8f52d0-cace-422d-be60-0fb2955e2f1e)  
<https://www.kyndryl.com/us/en/learn/disaster-recovery-plan>  
[https://www.kyndryl.com/us/en/learn/plan#:~:text=A%20business%20continuity%20plan%20\(BCP\)%20i](https://www.kyndryl.com/us/en/learn/plan#:~:text=A%20business%20continuity%20plan%20(BCP)%20i)

s%20a%20document%20that%20outlines,an%20unplanned%20disruption%20in%20service.  
<https://www.ibm.com/it-it/services/business-continuity/plan>  
<https://www.qmsuk.com/news/what-are-the-5-key-components-of-a-business-continuity-plan>  
<https://www.enisa.europa.eu/topics/threat-risk-management/risk-management>  
<https://www.continuityforum.org/content/news/2010/19/europe-moves-better-integrate-resilience>  
<https://eimf.eu/business-continuity-management/>  
[https://www.hpe.com/emea\\_europe/en/what-is/business-continuity.html](https://www.hpe.com/emea_europe/en/what-is/business-continuity.html)  
<https://www.qmsuk.com/news/what-are-the-5-key-components-of-a-business-continuity-plan>  
<https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/how-to-build-geopolitical-resilience-amid-a-fragmenting-global-order#/>  
<https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/risk-and-resilience-priorities-as-told-by-chief-officers>  
<https://www.e-education.psu.edu/matse81/node/2105#:~:text=We%20can%20define%20resilience%20of,of%20the%20stress%2Dstrain%20curve.>  
<https://www.merriam-webster.com/dictionary/resilience>  
<https://u-next.com/blogs/strategic-sales-management/vuca-model-in-strategic-sales-management-ethics-to-handle-vuca-environment/>  
<https://www.vmware.com/it/topics/glossary/content/business-continuity-application.html>  
<https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/from-risk-management-to-strategic-resilience>  
<https://www.mckinsey.com/featured-insights/business-resilience>  
<https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/the-postpandemic-board-agenda-redefining-corporate-resilience>  
<https://riskacademy.blog/what-does-an-awesome-risk-report-should-look-like/>  
<https://www.360factors.com/blog/five-steps-of-risk-management-process/>  
<https://www.accenture.com/us-en/blogs/how-accenture-does-it/how-your-business-can-prepare-for-the-worst-by-being-ready-with-the-best>  
<https://hbr.org/2012/06/managing-risks-a-new-framework>  
<https://www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/raising-the-resilience-of-your-organization>  
<https://pestleanalysis.com/what-is-pestle-analysis/>  
[https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility\\_en](https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en)  
<https://www.logicgate.com/blog/how-to-determine-risk-scores-internal-vs-external-risks/#:~:text=The%20risk%20score%20is%20the,confidently%20make%20decisions%20regarding%20Orisks.>  
<https://www.techtarget.com/whatis/definition/VUCA-volatility-uncertainty-complexity-and-ambiguity#:~:text=VUCA%20is%20an%20acronym%20that,and%20lead%20to%20better%20outcomes>  
<https://pestleanalysis.com/pest-analysis-template/>  
[https://www.ilo.org/actemp/publications/WCMS\\_760306/lang--en/index.htm](https://www.ilo.org/actemp/publications/WCMS_760306/lang--en/index.htm)  
[https://www.silicon-saxony.de/fileadmin/user\\_upload/Publikationen/NEXT\\_2\\_2022/silicon-saxony\\_2022\\_next\\_ENG\\_web.pdf](https://www.silicon-saxony.de/fileadmin/user_upload/Publikationen/NEXT_2_2022/silicon-saxony_2022_next_ENG_web.pdf)  
<https://positivepsychology.com/cognitive-biases/>  
<https://www.escattec.com/blog/what-does-the-5s-methodology-really-mean>  
<https://vinciworks.com/blog/how-do-biases-affect-risk-identification/>  
<https://bestoutcome.com/knowledge-centre/project-risk-management-bias-how-impartial-are-you/>  
<https://www.smartsheet.com/business-continuity-templates>  
<https://www.napier.ai/post/what-is-rbs>  
<https://blog.hubspot.com/service/business-continuity-plan>  
<https://www.bmc.com/blogs/business-continuity-vs-resiliency/>  
<https://www.iso.org/obp/ui#iso:std:iso:22316:ed-1:v1:en>  
<https://www.fmlink.com/articles/five-things-need-know-business-resilience-planning/>  
<https://www.thebci.org/news/enhancing.html>  
<https://onlinelibrary.wiley.com/doi/full/10.1111/ijmr.12289>