SusAF

The Sustainability Awareness Framework

Workbook

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The Sustainability Awareness Framework

The SusAF is a tool for sustainability design.
The SusAF workbook enables a guided elicitation and analysis of the potential sustainability effects of IT products and services.

Workbook

Overview: The SusAF

The process

Warm-Up

Introduction of the participants, the SusAF, and the IT product under analysis

20 Min

Capture

Collect and categorise potential effects of the IT products regarding sustainability

60 Min

Analysis

Build chains of effects in order to discover causal relationships

20 Min

Synthesis

Discuss opportunities and risks, and develop corresponding actions

20 Min

The dimensions

There are five dimensions of sustainability:

Social
Individual
Environmental
Economic
Technical

The templates

The templates provide examples, and instruction as well as fillable worksheets.

The diagram

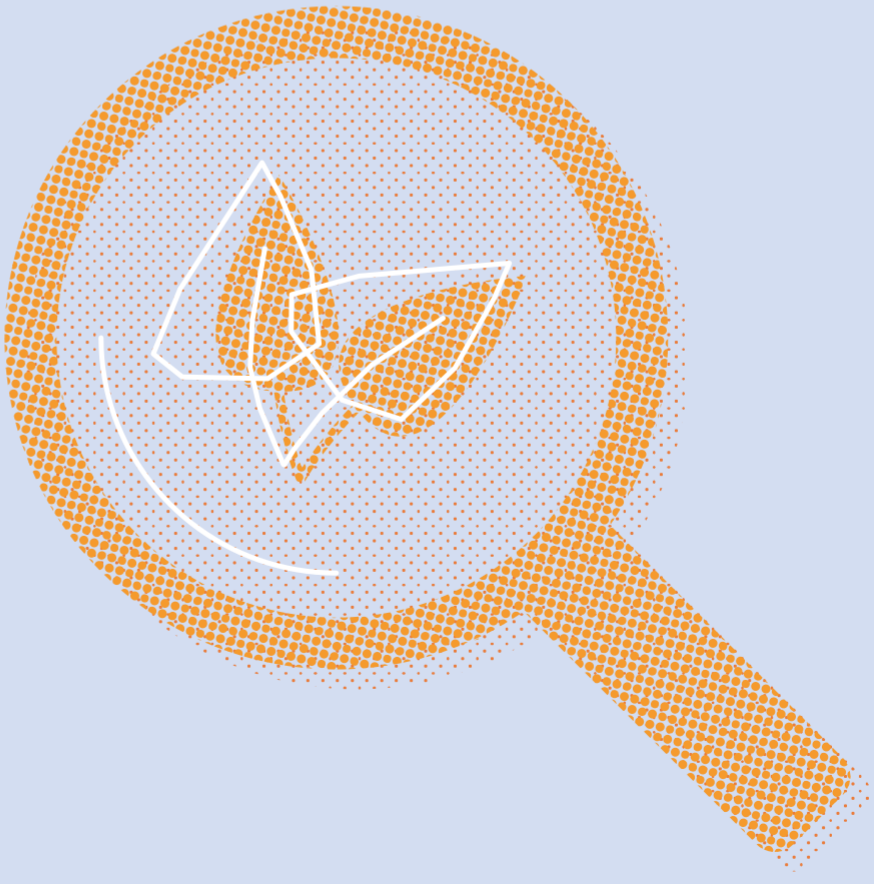
The diagram supports the visualisation of the analysed chains of effects.

The report

The report summarizes the most important results and measures.

Warm-Up

Introduce participants,
the SusAF,
and the IT product



Description of the IT **Product or Service:**

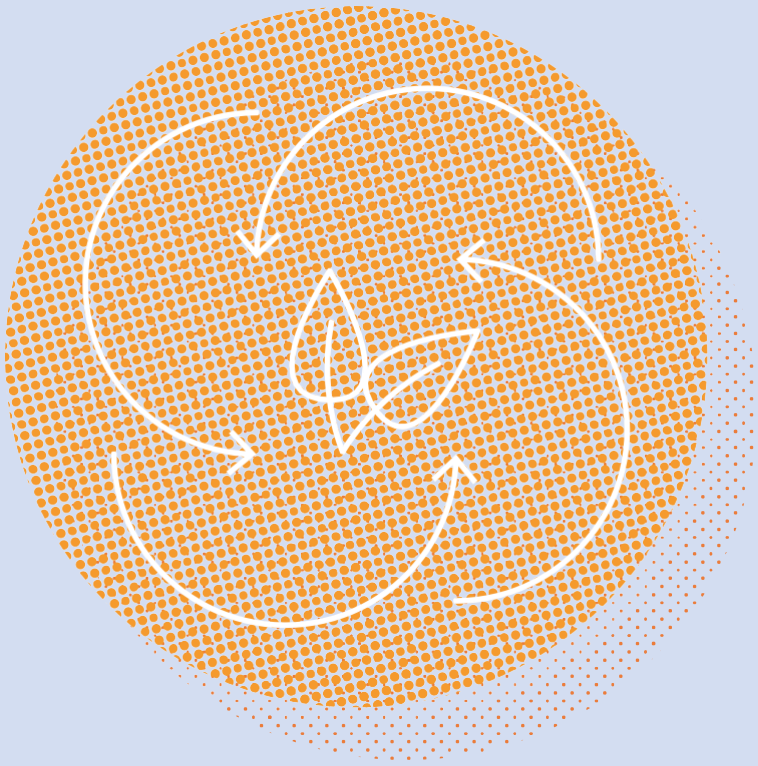
10 Min

List the **known sustainability effects** (SDG? CSR?):

10 Min

Capture

Collect and
Categorise Effects



Brainstorm

Instructions

2-5 Min brainstorm for every single question

1 Read the questions (starting page 11)

2 Write down the first effects that come to mind in your notes sheets (1 minute)

- **a.** Consider effects of the product/service, working process and business model.
- **b.** Positive effects on blue cards and negative effects on orange cards, (with 'rationale', if it was mentioned)
- **c.** Remember, quantity over quality

3 Present all the ideas within the team (5 minutes max.)

- **a.** Do not judge
- **b.** Do not worry if you are not able to comment on all ideas
- **c.** If applicable, cluster ideas

(Rationale: Rent rooms in private homes)

Effect: close contact with another culture

(Rationale: the product is community based)

Effect: develop a strong sense of community among equals
→ *less tolerance*

(Rationale: a lot of legacy code)

Effect: the software developer feels frustrated
→ *less job satisfaction*
→ *less loyalty to the project*

(Rationale: The customer allowscritical discussions)

Effects: The group is able to question possible effects and requirements

Discuss & Select

Instructions

7 Min discuss & select for every single question

Discuss all the ideas within the team

a. Decide which effects are worth capturing

a. Paste in likelihood & impact matrix

more contact to the landloard
→ *closer contact to other cultures*
→ *change of worldview*

additional income
→ *incentive for short-term renting*

develop a strong sense of community among like mindet people
→ *enhance personal believs*
→ *increasing intolerance*

Prioritize: Classify the effects using their likelihood and their level of impact

Dimensions: Social

Sense of community means the feeling of belonging to an organization, to an area or to a group of like-minded people.

- How can the product or service affect a person's sense of belonging to these groups?

Trust means having a firm belief in the reliability, truth, or ability of someone or something.

- How can the product or service change the trust between the users and the business that owns the system?

Inclusiveness and diversity refers to the inclusion of people who might otherwise be excluded or marginalized.

- How can the product or service impact on how people perceive others?
- What effects can it have on users with different backgrounds, age groups, education levels, or other differences?

Equity means the quality of being fair and impartial.

- How can the system make people to be treated differently from each other? (think data analytics or decision support)

Participation and communication refers to imparting or interchanging thoughts, opinions or information by speech, writing, or signs.

- How can the product or service change the way people:
  - › create networks?
  - › participate in group work?
  - › support, criticize or argue with others?

Dimensions: Individual

Health means the state of a person's mental or physical condition.

- How can the product or service improve or worsen a person's physical, mental, and/or emotional health?
- (For example, can it make a person feel anything good or bad - e.g. (under)valued, (dis) respected, (in)dependent, or coerced?)

Lifelong learning means the use of learning opportunities throughout people's lives for continuous development.

- How can the product or service affect people's competencies?

Privacy means being free from intrusion or disturbance in one's private life.

- How can the product or service expose (or help to hide) a person's identity, whereabouts or relations?

Safety means being protected from danger, risk, or injury.

- How can the product or service expose (or protect) a person from physical harm? How can it make a person feel more (or less) exposed to harm?
- What if used in an unintended way?

Self-awareness and Free will means the capacity of an individual to act or make decisions on their own.

- How can the product or service empower (or prevent) a person from taking an action / decision when necessary?
- Can those affected by the product or service understand its implications, express concerns or be represented by someone?

Dimensions: Environmental

Material and resources includes everything that is needed to produce, deploy, operate, and cease a product or service.

- How are materials consumed to produce the product or service?
- What about to operate the product or service? E.g., requires hardware.
- How can it change the way people consume material? E.g., encourage to buy more?

Waste & pollution means effects the product or service might have on soil, atmospheric, and water pollution.

- How can producing parts or supplies generate waste or emissions?
- How can the use itself produce waste or emissions?
- How can it influence how much waste or emissions are generated?
- How can it promote (or impair) recycling?

Biodiversity includes the effects of a product or service on biodiversity in its operational environment and other affected land.

- How can it impact the plants or animals around it? Or elsewhere?
- How can it change composition of the soil around it? E.g., occupying / cropland?
- What about elsewhere?

Energy means all energy use that results from producing and using a product or service.

- How can the product of service affect the need for production of energy?
- What about the use of energy? E.g. encourages less energy.
- Does the hardware run on renewable energy? Is there a way to incentivise that?

Logistics means the effects of the product or service on moving people and/or goods.

- How can it affect the need (and distance) for moving people or goods?
- How can it affect the means by which people or goods move?

Dimensions: Economic

Value means the worth, or usefulness of something, principles or standards; judgement of what is important in life.

- How can the product or service create or destroy monetary value? For whom?
- Are there any other related types of business value? For whom?

Customer Relationship Management steers a company's interaction with current and potential customers to improve business relationships (e.g. retention, growth).

- How can the product or service affect the relationship between the business and its customers?
  How can it enable co-creation or co-destruction of value?
- How can it impact the financial situation of their customers & others?

Supply Chain means a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer.

- How can the product or service affect the supply chain of the business who owns it?
  How can these changes in supply chain impact the financial situation?
- How can it impact the financial situation of their customers & others?

Governance means the processes of interaction and decision-making among the actors involved in a system through the laws, norms, power or language of an organized society.

- How can the product or service affect how and by whom such decisions are made?
- How can the product or service affect the communication channels by which the relationships takes place?
- How can these changes impact the financial situation of the business and partners?

Innovation refers to something new or to a change made to an existing product, idea, or field.

- Do (parts of) the product or service affect the investment on research & development?
  How can changes in innovation and R&D impact the financial situation?
- Can it also impact the financial situation of their customers & others?

Dimensions: Technical

Maintainability means the degree to which an application is understood, repaired, or enhanced.

- How are the operating system and runtime environment expected to change what does that required from maintainers of this system?
- How can the correctness of the system be affected by other systems or affect the correctness of others?

Usability means the ability of users to productively use the system for the intended purpose.

- What kind of knowledge or physical properties are required to use the system and how can this affect different types of users? For example, is good eyesight and small, sensitive hands required to operate a system on a small handheld device?

Adaptability means the ability of a system to adapt itself to fit its behaviour according to changes in its environment or in parts of the system itself.

How could someone want to use the system in another context?
What can make that easier/more difficult?

- What can make that easier/more difficult for the system to adapt itself to fit new usage scenarios?

Security means freedom from, or resilience against, potential harm (or other unwanted coercive change) caused by external or internal attacks.

- Which assets controlled by this system would be desirable to an attacker?
  E.g. financial information, people's whereabouts or preferences, etc.
  What are the risks associated with these assets?
- What are other likely vulnerabilities of the system?

Scalability means the systems ability to handle growing amounts of work in a graceful manner or to be enlarged horizontally or vertically and will continue to function with comparable response times.

How can the system support changes in workload?

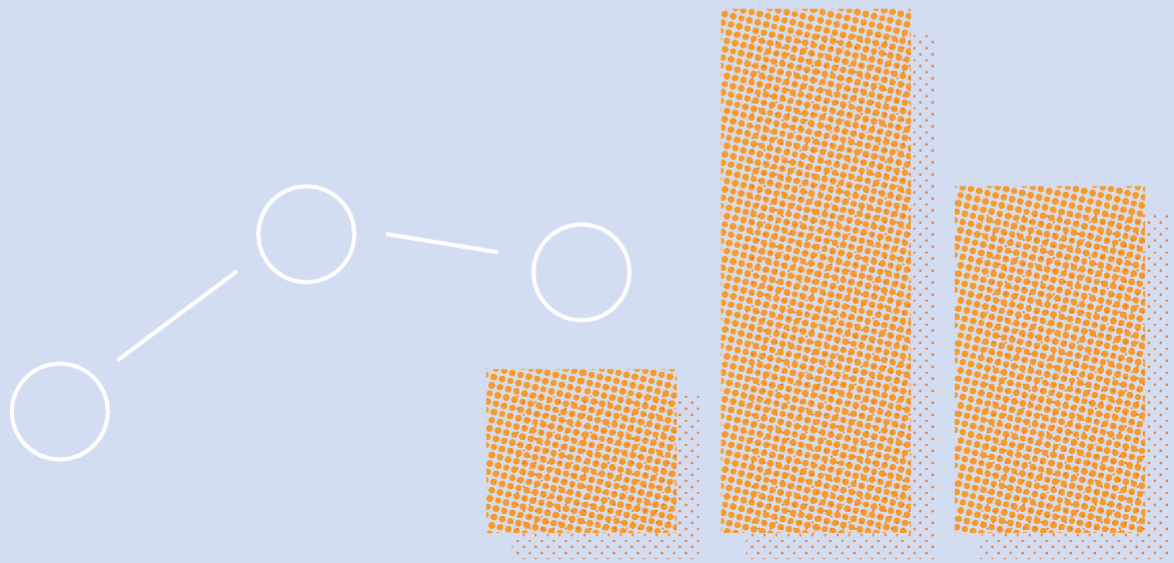
- What can make that easier/more difficult?

Break

10 minutes

Analysis

Build chains
of effects in order
to discover
causal relationships

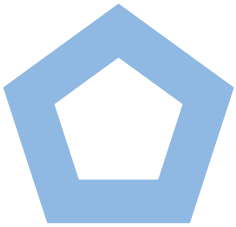


Orders of Effects

Orders of effects relate the short and long-term effects of the respective dimensions to each other. This way, chains of effects can be discovered.

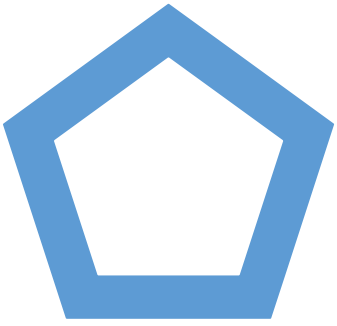
1. Immediate (First-Order)

Immediate are direct effects of the production, operation, use and disposal of socio-technical systems. This includes the properties and the full lifecycle impacts, such as in the Life-Cycle Assessment (LCA) approach.



2. Enabling (Second-Order)

Enabling of operation and use of a system include any change enabled or induced by the system. Specifically, effects that occur during usage and changed behaviour. For example, the shared use of resources like cars and tools.

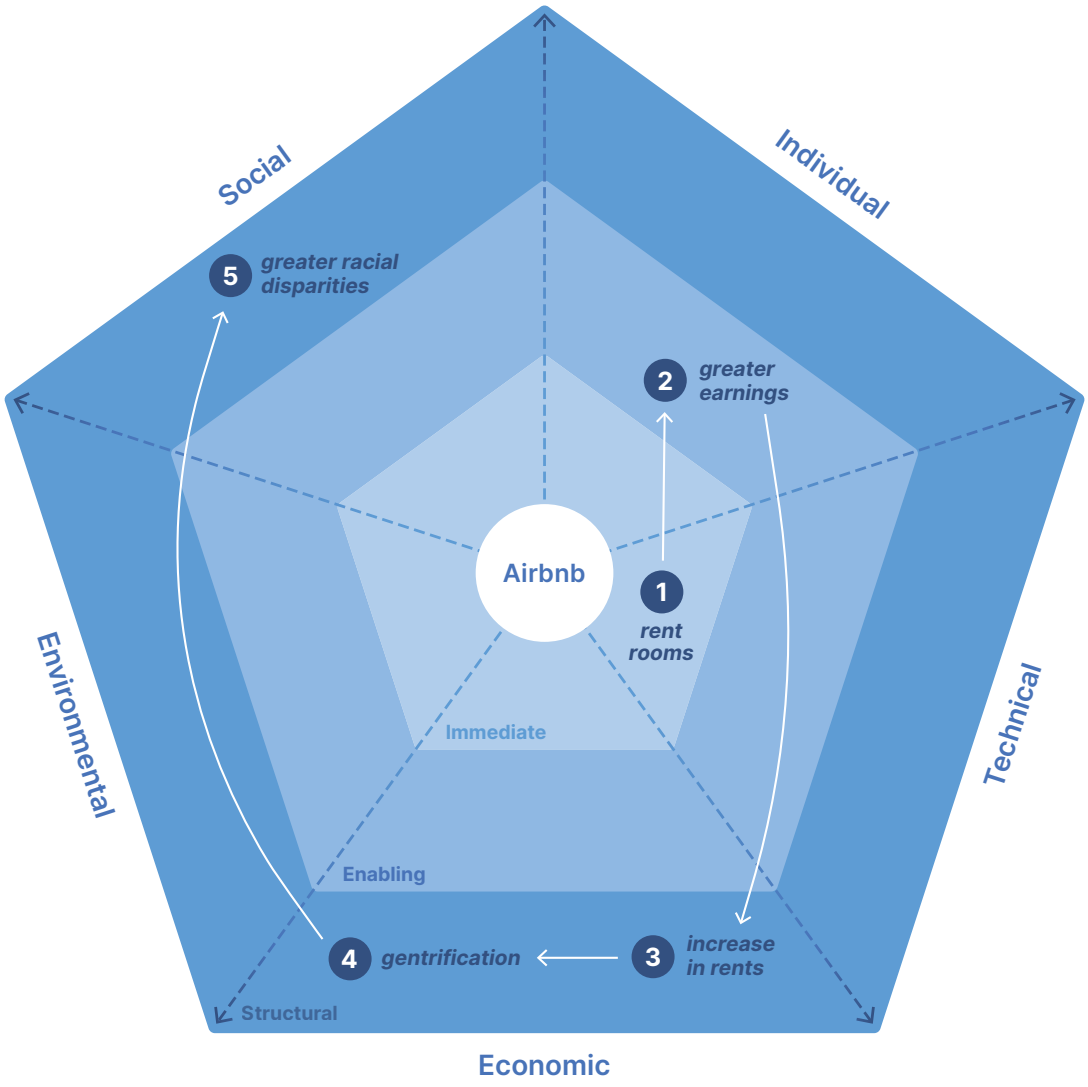


3. Structural (Third-Order)

Structural represent structural changes caused by the ongoing operation and use of the socio-technical system. They originate in the continuous accumulated usage of software systems with many users. The effects manifest for example in politics, social norms and legislation.

Sustainability Awareness Diagram

- Is based on a radar chart
- It is about cause and effects
  - How do we get to a specific effect?
  - What does this effect lead to?
- Effects are placed in the dimensions and order of effects. They are connected with arrows (Cause and Effect); see Airbnb example.



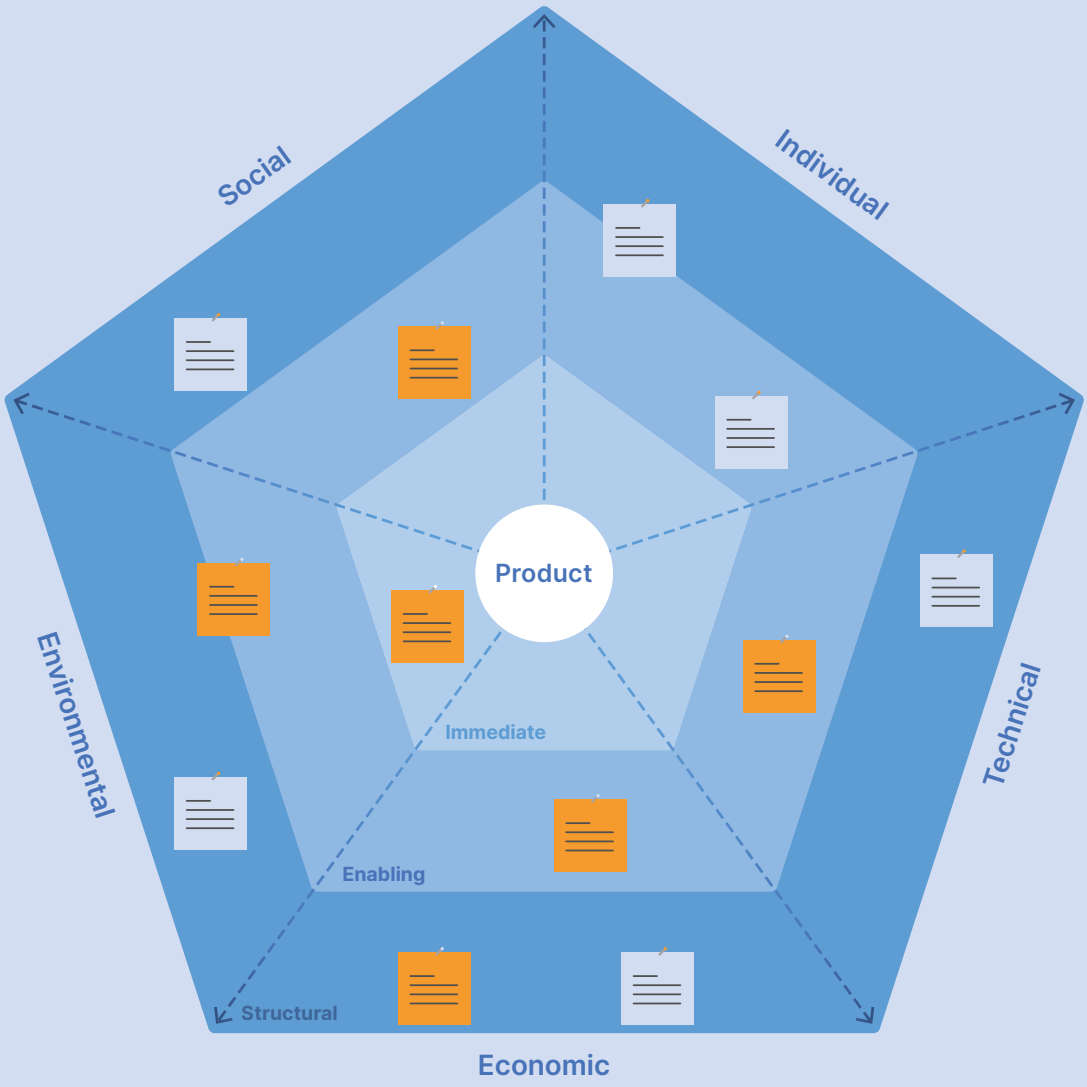
Filling the SusAD

15 Min

1. Paste the effects from the high impact and likelihood corner of the matrix onto the SusAD according to dimension and order of effect.

2. Look at the remaining, less likely or less impactful, ones and choose which ones to still add to the SusAD (so it does not get too crowded).

3. Imagine your IT product or service is being used by many people over an extended period of time. What consequences may this have? And how do they relate?



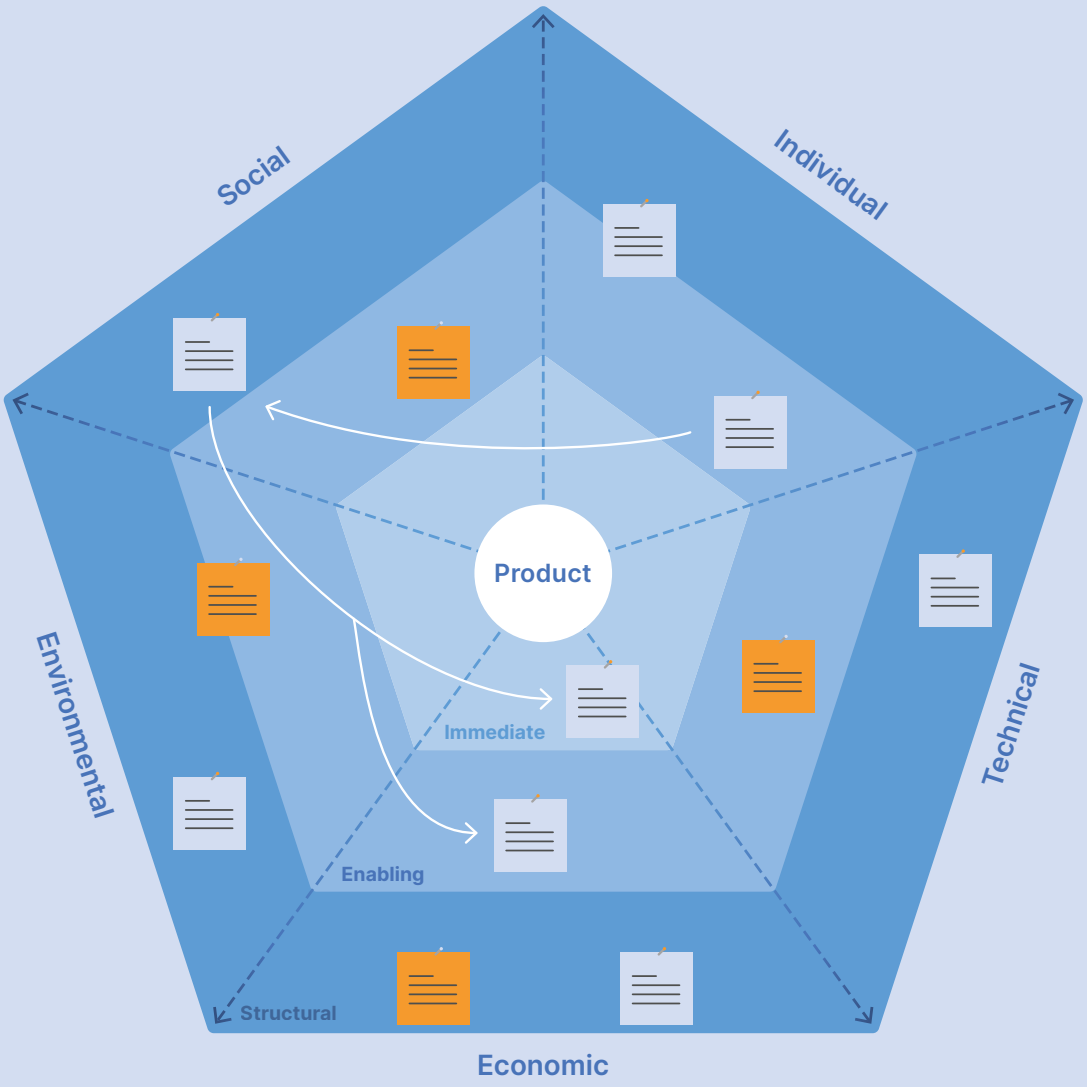
Chains of effects

Identify chains of effect:

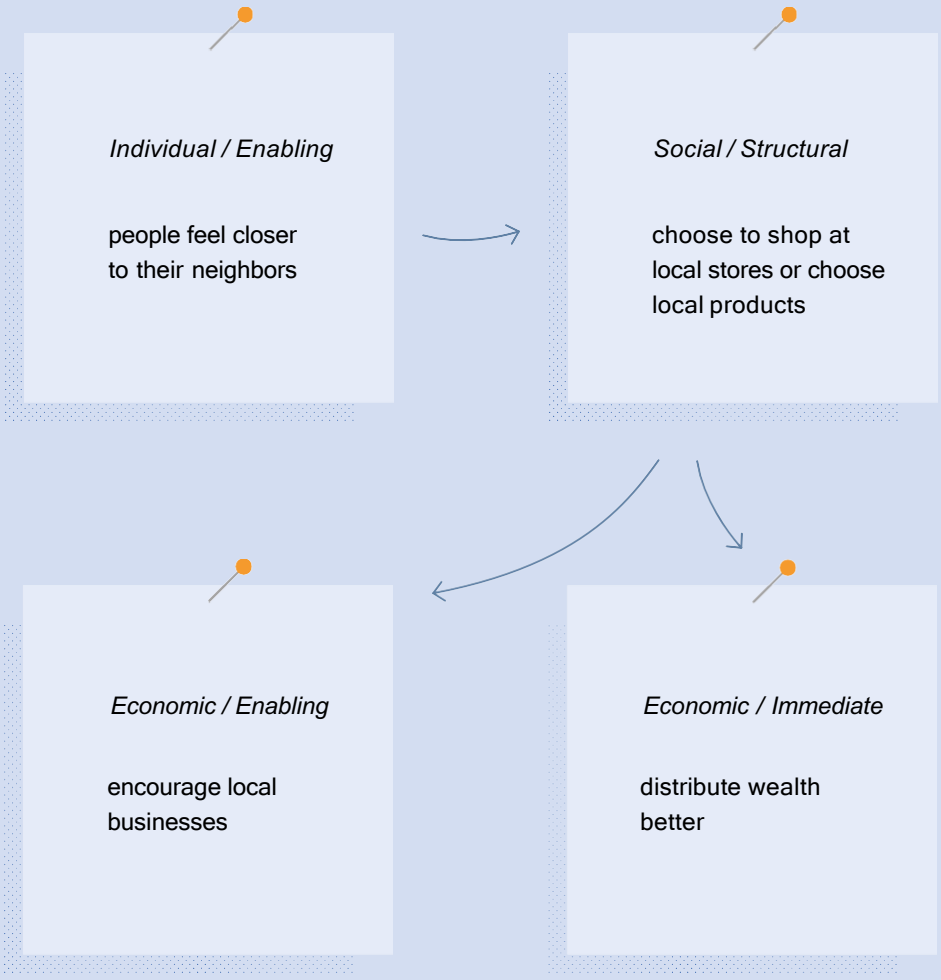
15 Min

Draw relations between the effects that may happen when many people use this product or service for several years:

1. Think about which second order effects stem from which first order effects, and
2. Which third order effects can be a consequence of some second order effects
3. Effects can also have a related effect of the same order, and/or of a different dimension

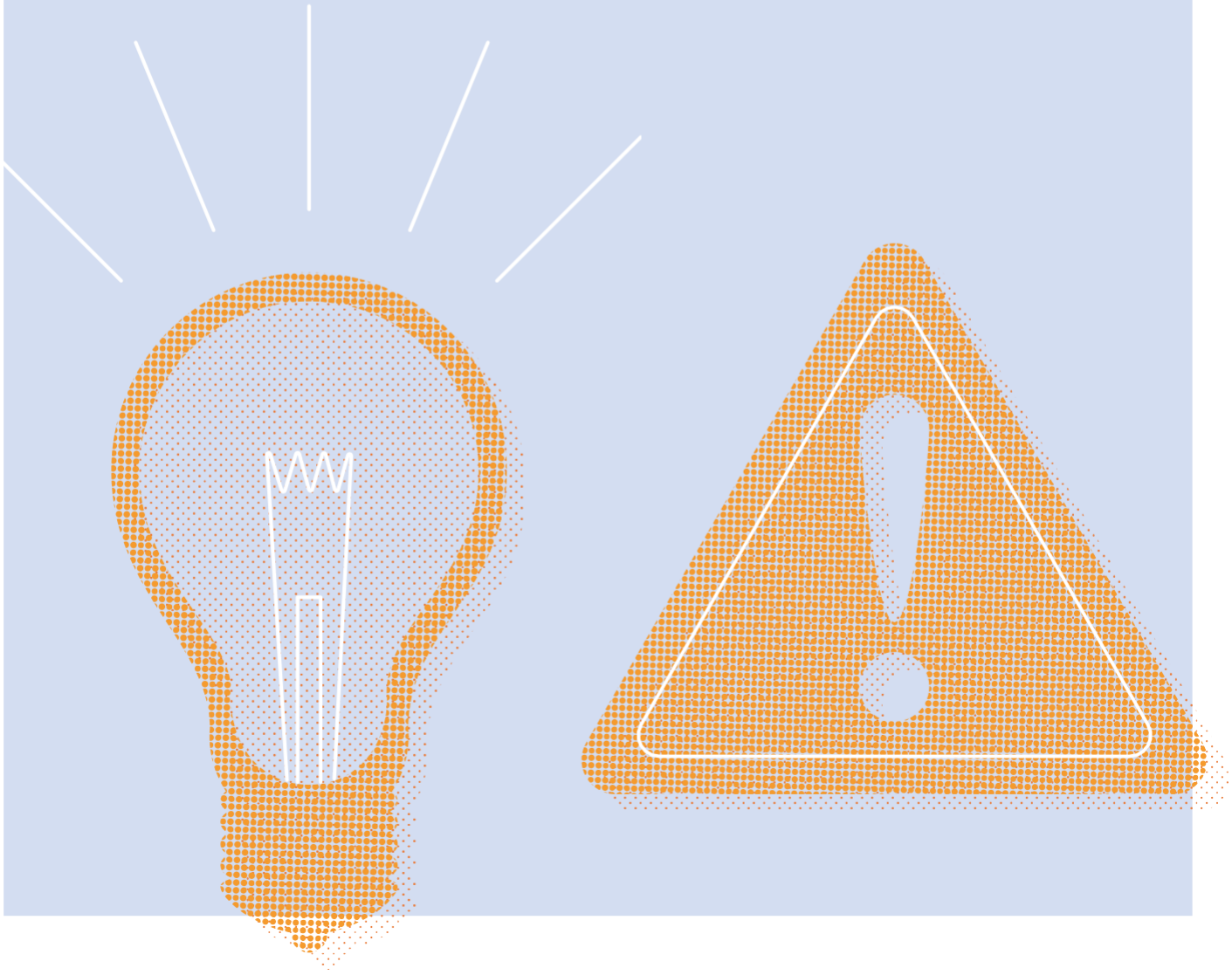


Example: If people feel closer to their neighbors, they can choose to shop at local stores or choose local products, which can encourage local businesses and ultimately distribute wealth better



Synthesis

Translate effects into opportunities and threats



Synthesis: Threats, opportunities, actions

Identification of the biggest threats and opportunities as well as the developmen of adequate measures

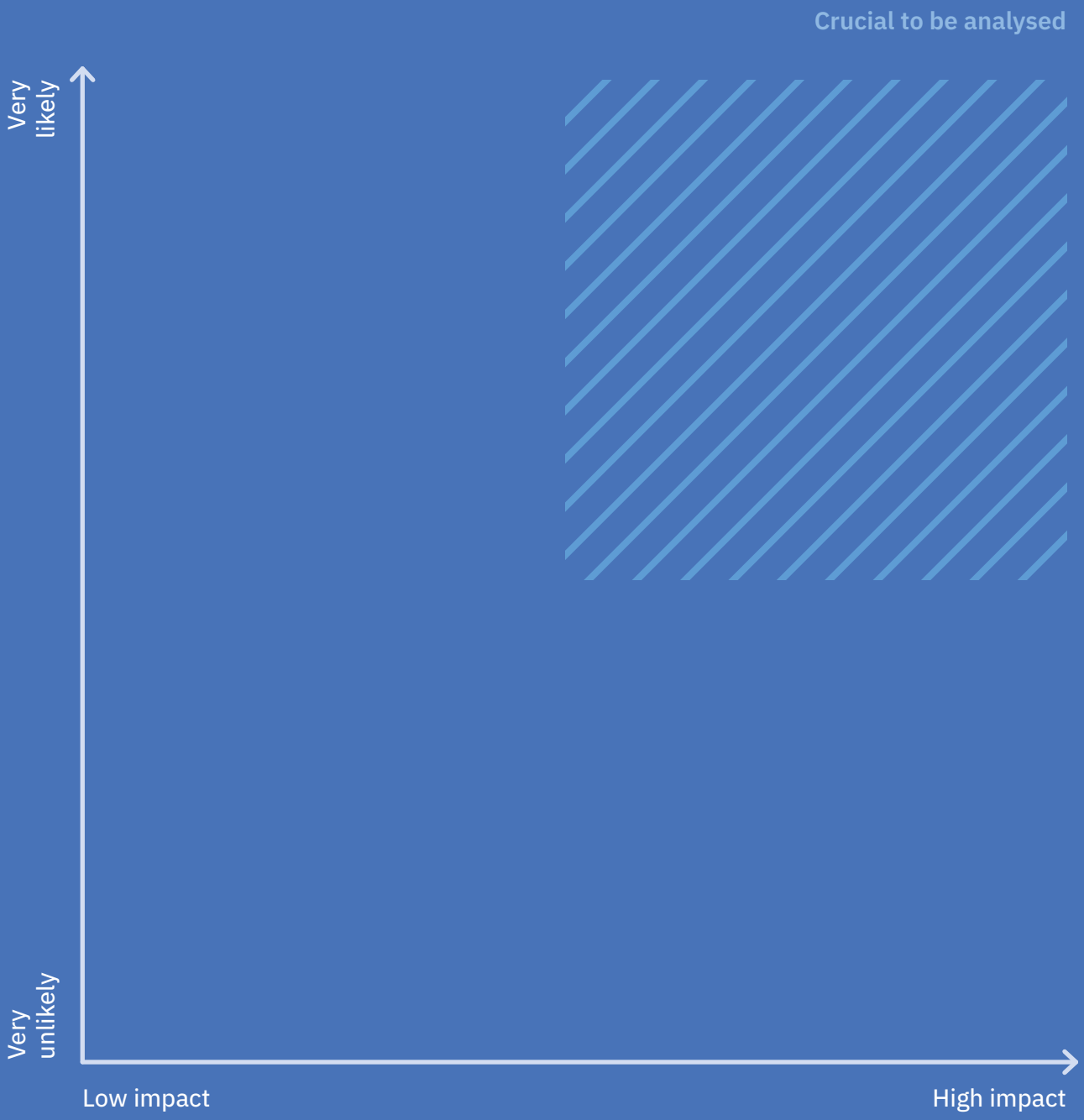
15 Min

Opportunities → Actions

Threats → Actions

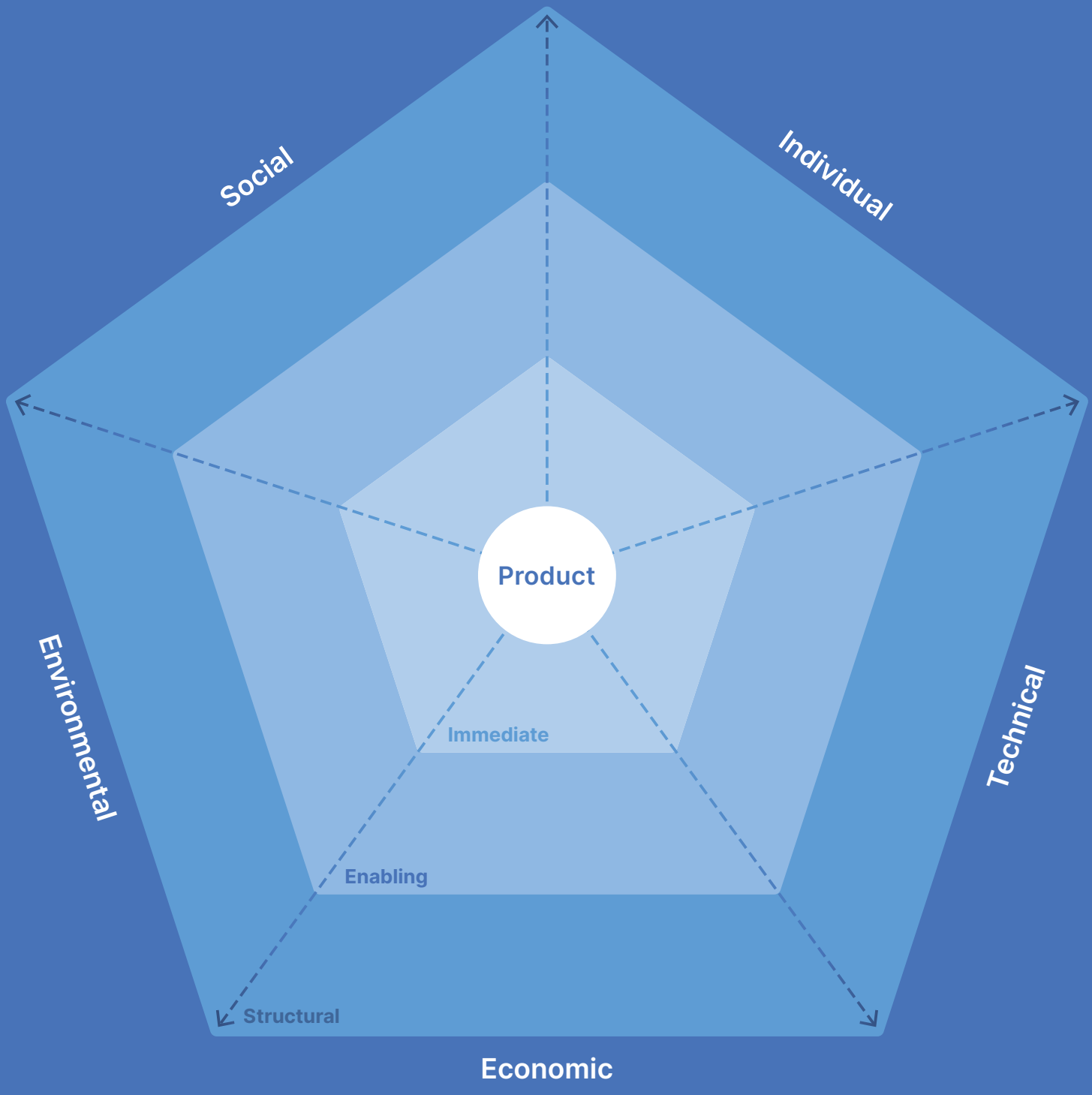
Template 1

Classification of likelihood and impact



Template 2

The SusAD



Continued collaboration

approx. 90 min.

Interviews on the state of practice as a team of IT practitioners → you receive the results of your analysed interviews.

approx. 4 hours

A detailed workshop → you receive a detailed analysis regarding the sustainability of your IT product and services and the resulting opportunities and risks for your company.

Questionnaire

Was this useful to you?
Let us know in the survey! →

IMPRESSUM

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KARLSKRONA MANIFESTO FOR SUSTAINABILITY DESIGN

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