

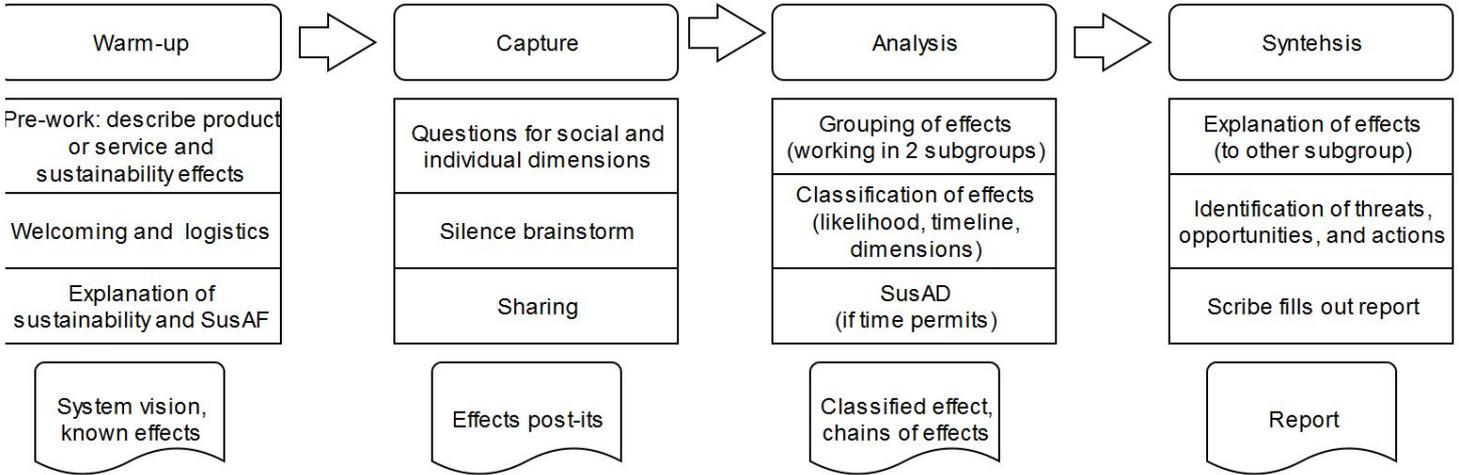


# SUSAF "TASTER" - THE SUSTAINABILITY AWARENESS FRAMEWORK

**The taster workbook  
- fill me in step by step.**

# OVERVIEW: THE SUSAF TASTER

## THE PROCESS



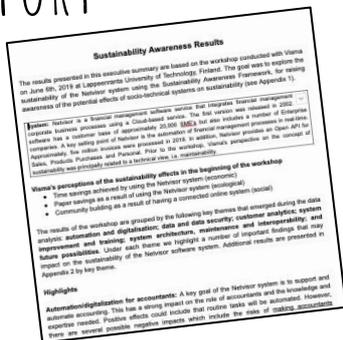
## THE QUESTIONS

<b>Social</b>	Sense of community, trust, inclusiveness, equity, participation
<b>Individual</b>	Health, lifelong learning, privacy, safety, agency
<b>Environment</b>	Material & resources, waste & pollution, energy, biodiversity, logistics
<b>Economic</b>	Value, CRM, supply chain, governance, innovation
<b>Technical</b>	Maintainability, usability, adaptability, security, scalability

## THE TEMPLATES



## THE REPORT



## THE DIAGRAM

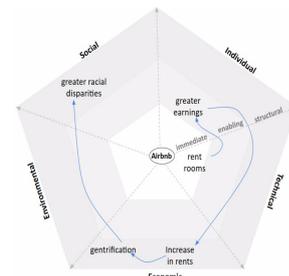


Figure 1. Simplified SusAD diagram for Airbnb system

### Timing:

Warm up 30 min, capture 60 min, analysis 20 min, synthesis 30 min

# CAPTURE: SILENT BRAINSTORM

## Instructions:

1. Listen / read the question
2. Write the first effects that come to mind (1 minute)
  - a. Consider effects of any "fact" of the product / service
  - b. Functionality, characteristic, organization, business
  - c. Positive effects on green and negative on orange cards
  - d. Include a Heading
  - e. Look for quantity, not quality
3. Each person explains their ideas and paste the post-its on the effect sheet (30 seconds / person)
  - a. Don't judge
  - b. Don't worry if you can't comment on all your ideas

*(Fact: lets rent rooms in private homes)*

*Effect: close contact with another culture*

*(Fact: the product is community based)*

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

*Yes, very*



*(Fact: The customer allows critical discussions)*  
*Effects: The group is able to question possible effects and requirements*

*(Fact: a lot of legacy code)*

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

# QUESTIONS: SOCIAL

**Sense of community** means the feeling of belong 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?

# QUESTIONS: 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 undervalued, disrespected, 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?

**Agency** means the capacity of an individual to act or make decisions of their free will.

- 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?

# QUESTIONS: ENVIRONMENTAL

**MATERIAL AND RESOURCES** means equipment and other material that is required for the system, including for users of the system.

- How does the system affect the use of materials and resources of the technical system and its users?
- How does the system change the way people consume material? For example, encourage people to buy more or less?

**SOIL, ATMOSPHERIC AND WATER POLLUTION.** Think again about the equipments and supplies that are part of or needed for the system.

- How does producing or maintaining the system generate waste or emissions?
- How does the system influence how much waste or emissions people or institutions generate?

**Biodiversity and land use** means affecting the abilities of wildlife to exist.

- How can the system create changes in the composition, size, or use of land?
- How may this affect wild species dependent on land or water?

**Energy** means the requirements for running the system but also for users of the system or others affected by the system.

- How does the system, its users or other beneficiaries affect the production of renewable energy?
- How does the system, its users or other beneficiaries affect the total use of energy?

**Logistics and transport** means the requirements and conditions for moving goods and people.

- How can the system affect the total needs for transportation?
- How can it affect the means by which people or goods move?

# QUESTIONS: ECONOMIC

**Value** means monetary value.

- How can the system create or destroy monetary value? For whom?

**Customer relations management** means the relations the organization hosting the system has with customers, clients or patients.

- How does the system affect the relationship between the organization hosting the system and external parties who use it, such as customers?
- How can such changes in relationships have financial effects on the hosting organization or individuals?

**Supply chain** means the chain of companies or parties involved in producing products or services at the company/public institution where the system is deployed.

- How can the system alter the supply chain of the organization hosting the system?
- How can such changes in supply chains have financial effects on the hosting organization or individuals?

**Innovation, research & development (R&D)** means activities that can contribute to new products or services.

- How can the system affect the areas for, or amount of R&D activities of the organization?
- How can these changes in R&D have financial effects on the organization or those dependent on it?

# QUESTIONS: TECHNICAL

**Maintainability** means ability to fix bugs and maintain operational status over time.

- How can the system design affect the needs for and ability to fix bugs in ten years' time? Consider the effects bugs would have on users of the system.
- What will be required to maintain the system in it's intended state for ten years? Consider the operating system, runtime environment and hardware requirements of the system, and how bugs in other system may affect your system.

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

- What kind of knowledge or physical properties is required to use the system? For example, is good eyesight and small, sensitive hands required to operate a system on a small handheld device?

**Extensibility and adaptability** means the ability to modify the system to accommodate changing needs.

- How can the system design affect the ability to add substantial new features? (For example, have you selected a native Android app as user frontend, or have you opted to design the system as a web application or using a cross-platform development framework?)

**Security** means the integrity, availability and appropriate confidentiality of assets controlled by the system.

- How can the system affect the integrity of assets under control, so that they are not improperly altered?
- How can the system affect the availability of assets under control, so that they are not denied to legitimate users?
- How can the system affect the confidentiality of assets under control, so that **only** legitimate users have access?

**Scalability** means the ability to cater to higher workloads as needed.

- How can the system handle changes in workloads? For example, consider if 1000 or 1000 000 times more requests were made each second to your system. What effects would that have?

# ANALYSIS: SELECTION

In groups of perceived positive/negative effects

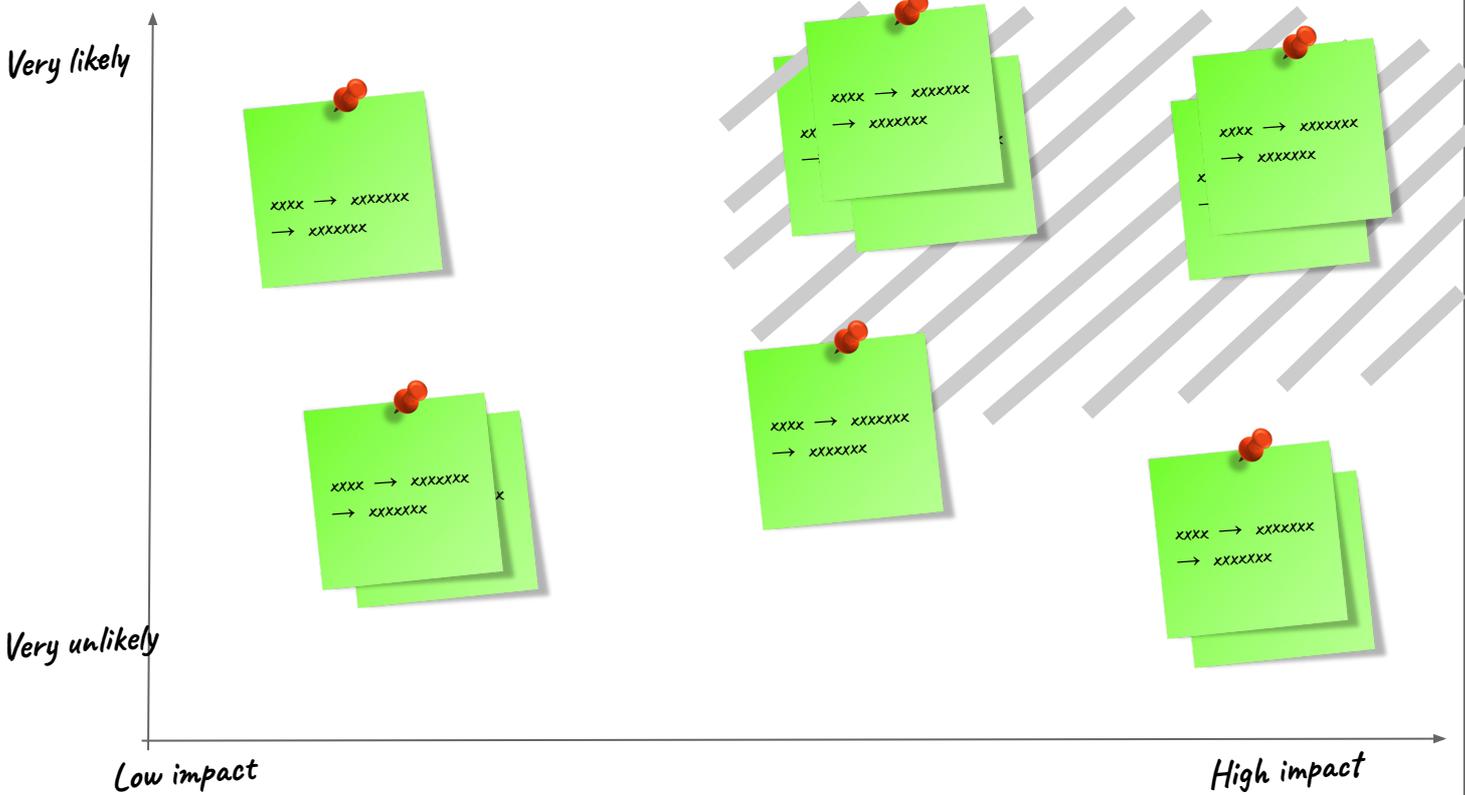
**Group:** Group related ideas, creating post-it "titles", if necessary

more contact with the owner → close contact with another culture → worldview change

Extra income → incentive to use

develop a strong sense of community among equals → reinforce their own views → greater intolerance

**Prioritize:** classify effects based on likelihood and impact

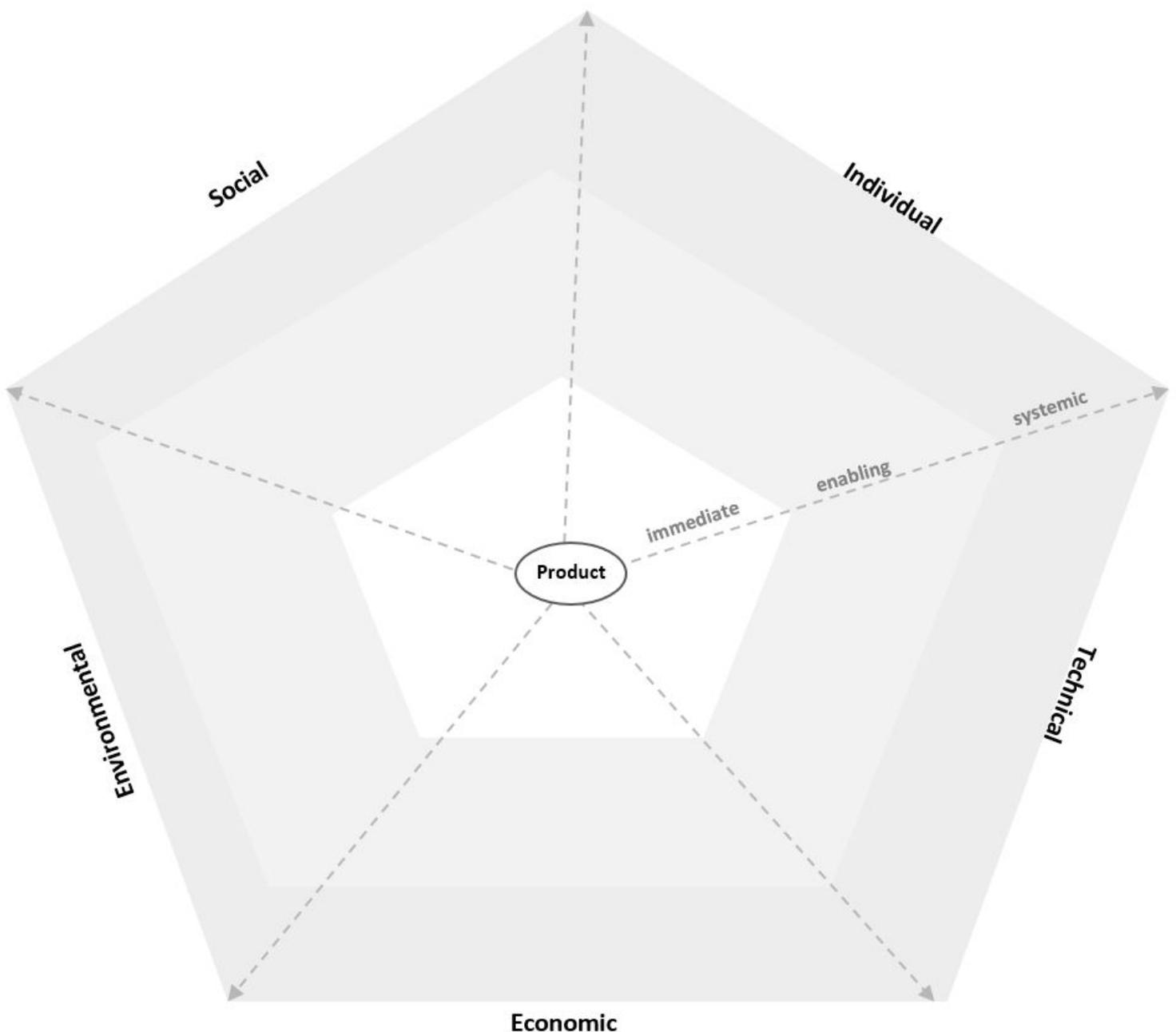


# ANALYSIS: CHAIN OF EFFECTS

## Identify: a key chain of effect

Imagine many people around the world are using this product or service for many years or decades. Think about how one thing can lead to another.

For 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: THREATS, OPPORTUNITIES, ACTIONS

<b>Threats</b>	<b>Actions</b>
<b>Opportunities</b>	<b>Actions</b>

# APPENDIX : SUSTAINABILITY AWARENESS FRAMEWORK

In this workshop, **sustainability** is the “*capacity of a socio-technical system to endure*”. More specifically, it refers to how systems that emerge from the interaction of a technical solution with humans and their environment can endure within the current economic, environmental, social, technical and individual settings. These are commonly referred to as the five dimensions of sustainability.

**Example:** Airbnb is a platform that offers a peer-to-peer short-term accommodation. In New York, homeowners can earn 55% more than the median long-term rental in the same neighbourhood (affecting the individuals and the economy). As a consequence, it is estimated that Airbnb has *removed* between 7,000 and 13,000 units of housing in New York from the long-term rental market, leading to an *increase of 1.4% in the median long-term rent* (affecting the society and the economy) and gentrification in areas where 72% are non-white, also increasing the race separations across the city (affecting the society).

The **Sustainability Awareness Framework** (SusAF) is a tool that supports stakeholders with different viewpoints to start a conversation on the possible effects of a socio-technical system on sustainability. It aims to raise awareness on the relationship between software and sustainability; a comprehensive sustainability impact analysis requires further work.

The SusAF is concerned with five **dimensions of sustainability** and the three **order of effects**:

## Definition of Sustainability Dimensions

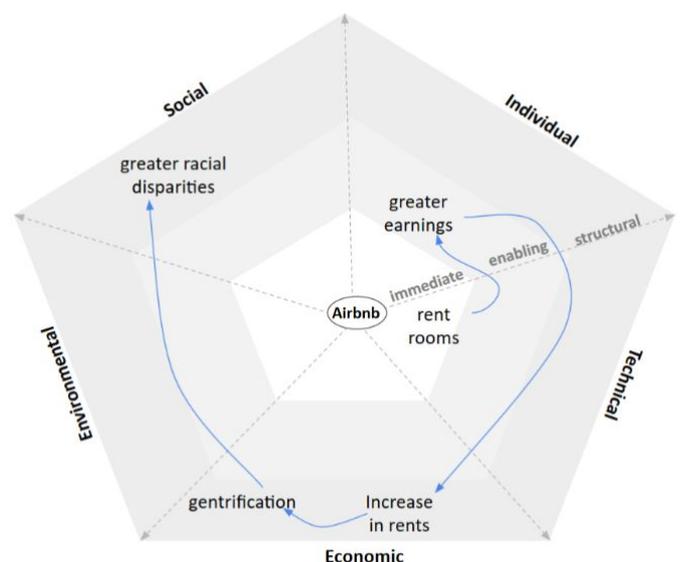
- Social:** covers the relationships between individuals and groups.
- Individual:** covers the individual's' ability to thrive, exercise their rights, and develop freely.
- Environmental:** covers the use and stewardship of natural resources.
- Economic:** covers the financial aspects and business value.
- Technical:** covers the technical system's ability to accommodate changes

## Definition of the order effects

- 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.
- Enabling** of operation and use of a system include any change enabled or induced by the system.
- Structural** represent structural changes caused by the ongoing operation and use of the socio-technical system

The SusAF **questions sheets** and the **Sustainability Awareness Diagram** (SusAD) for guiding discussion on the potential effects of technical systems and visualizing potential chains of effects.

Social	(1) Sense of Community; (2) Trust; (3) Inclusiveness and Diversity; (4) Equality; (5) Participation and Communication;
Individual	(1) Health; (2) Lifelong learning; (3) Privacy; (4) Safety; (5) Agency;
Environment	(1) Material and Resources; (2) Soil, Atmospheric and Water Pollution; (3) Energy; (4) Biodiversity and Land Use; (5) Logistics and Transportation;
Economic	(1) Value; (2) Customer Relationship Management (CRM); (3) Supply chain; (4) Governance and Processes; (5) Innovation and R&D;
Technical	(1) Maintainability; (2) Usability; (3) Extensibility and Adaptability; (4) Security; (5) Scalability;



Example of SusAD for one chain-of-effects in Airbnb



# THANK YOU FOR USING SUSAF!

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**Feedback:** Yes, please! Scan the QR code:

