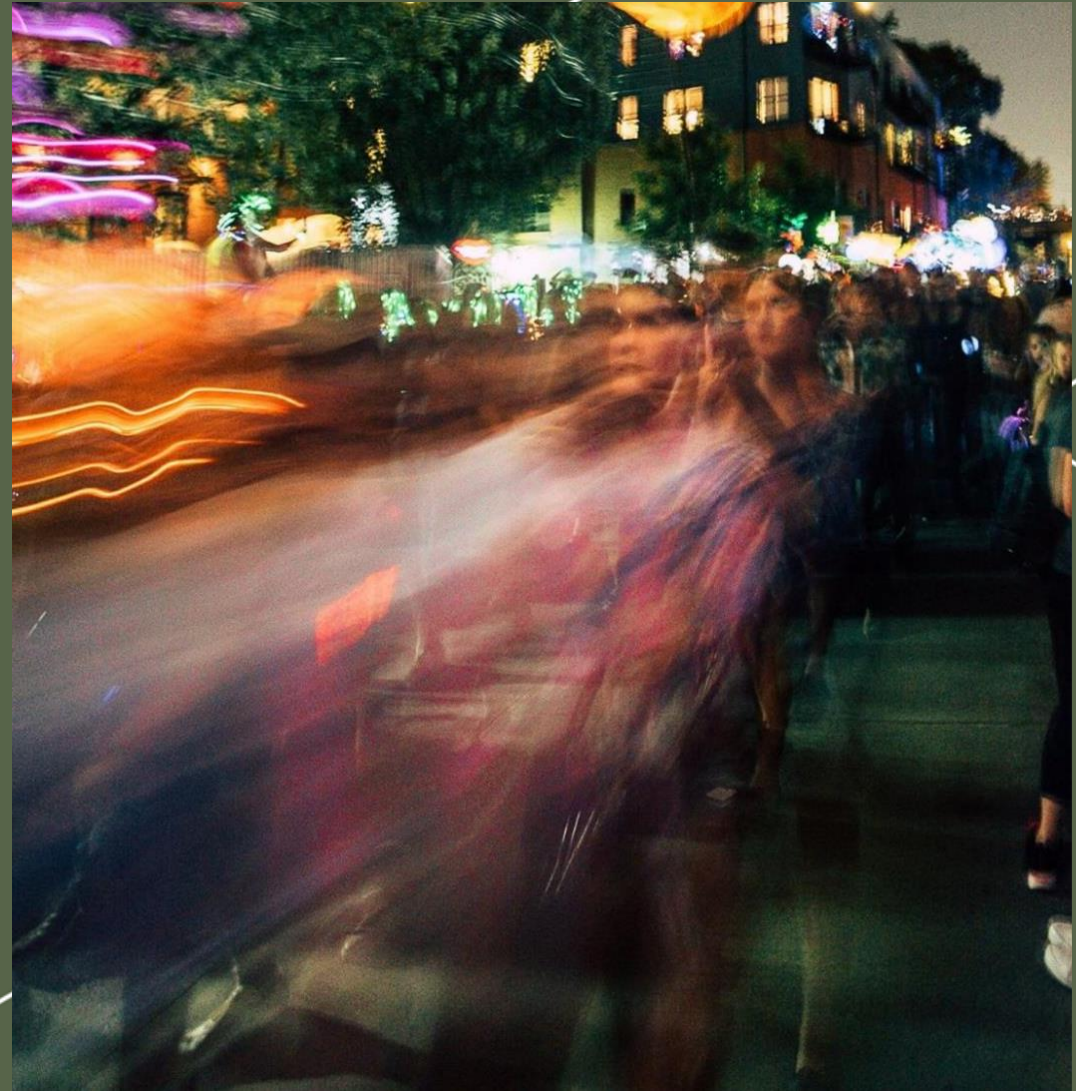




# Sustainable AI

Mapping the current state of the field in  
Finland and beyond

Spring 2022



SOLITA

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# Executive summary



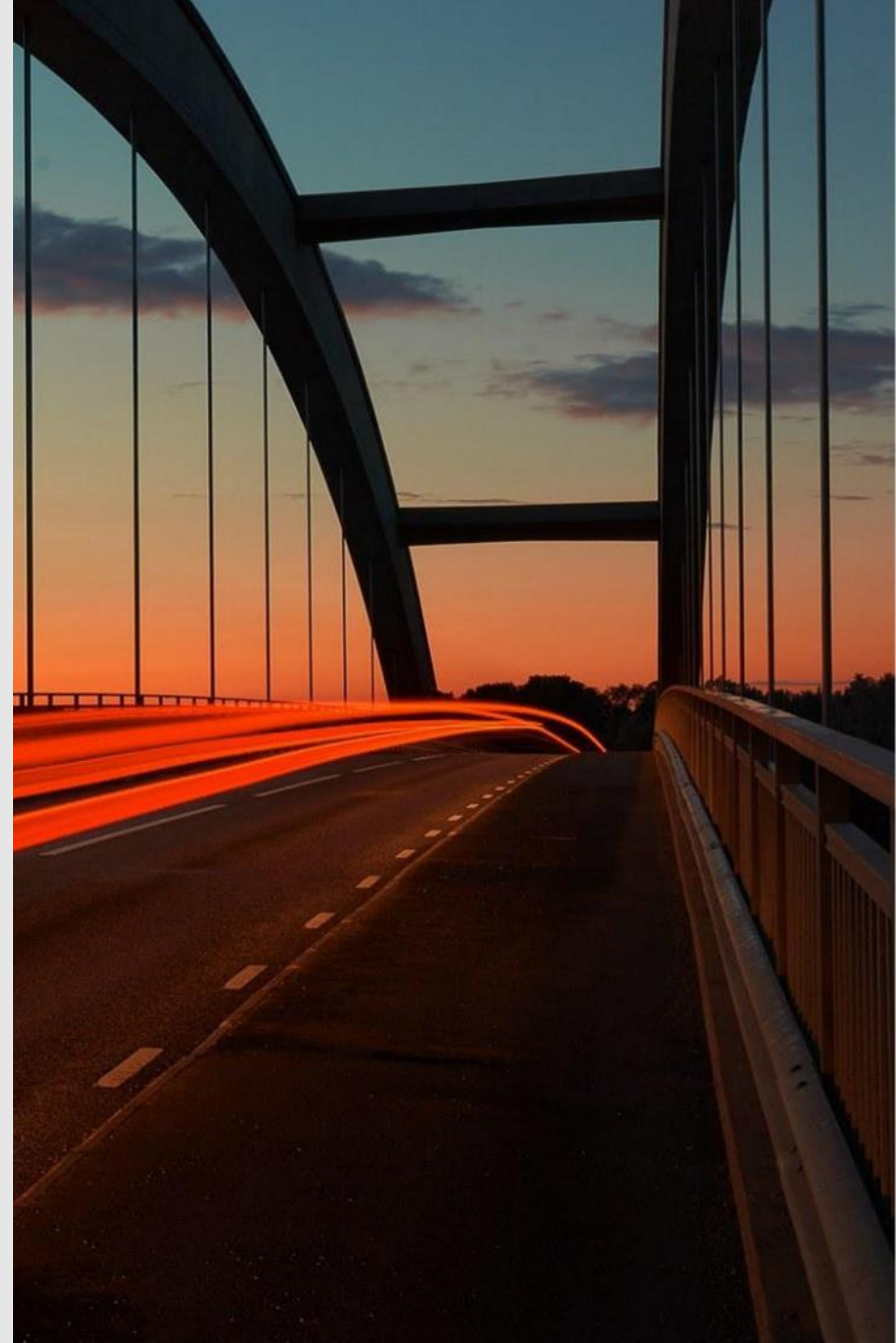


# Solita survey of the state of Sustainable AI in 2022

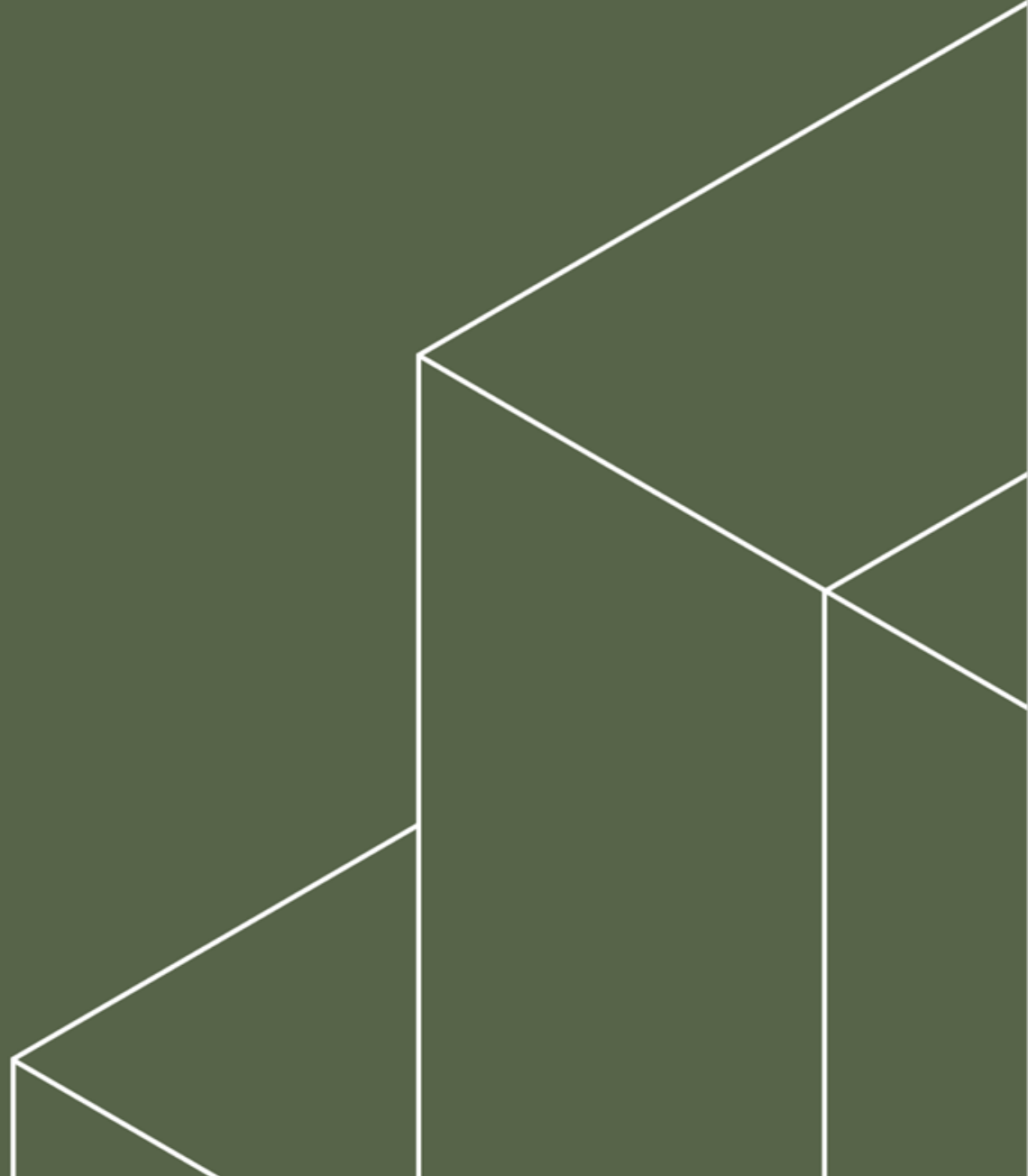
- During spring 2022, Solita conducted a qualitative study to find out **what sustainable AI means to different organisations** and what they are currently doing about it.
- We spoke with **26 organisations** across **15 industries**, both public and private, operating in Finland and beyond.
- This executive summary lists our key findings. More detailed insights can be found in the main report.

# Key findings

- 1. Terms and definitions are not established**, causing uncertainty and an inability to move forward.
- 2. Organisational ownership is unresolved.** The topic is multidisciplinary and doesn't naturally fall on any existing role or function.
- 3. Ethical AI principles exist, practices are rare.** The topic may seem distant, but existing processes for e.g. data governance and risk management serve as a good foundation.
- 4. Sustainable AI brand can bring competitive advantage** through customer loyalty and easier access to scarce talent.
- 5. Future regulatory impact is not yet on the radar.** With the EU AI Act approaching, the time to act is now.



# Premise



We wanted to know what Sustainable AI means to different organisations.

So we asked.

33

people

26

interviews

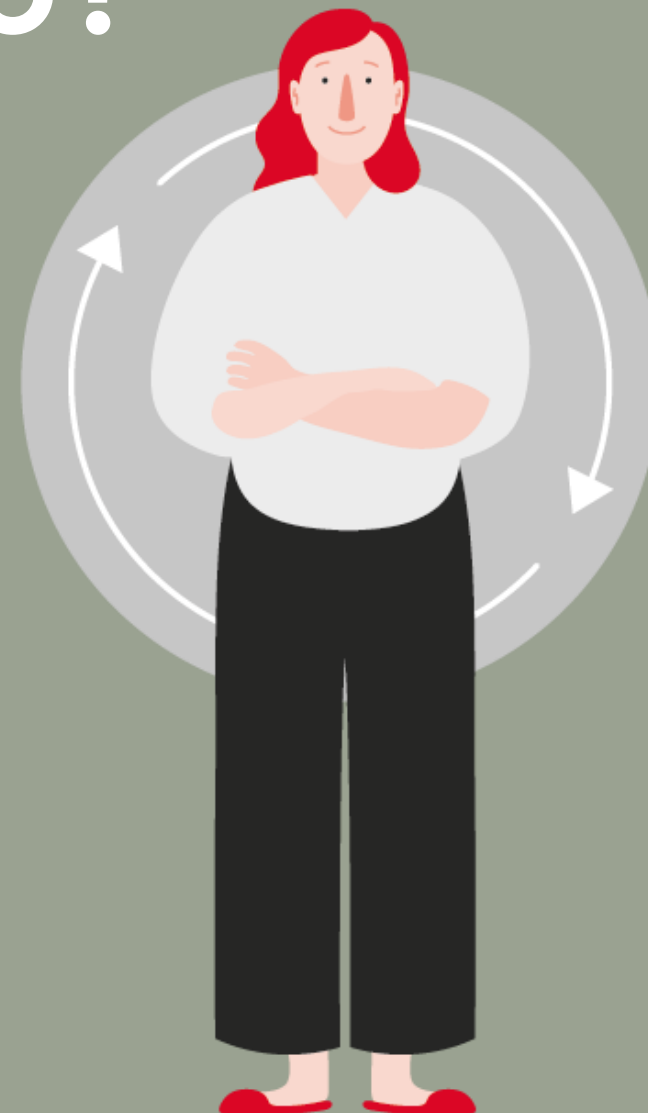
15

Industries, public and private





# Who did we talk to?



**CIO**      **Head of Data**

**R&D Lead**      **CTO**

**CDO**      **AI Specialist**

**Data Scientist**

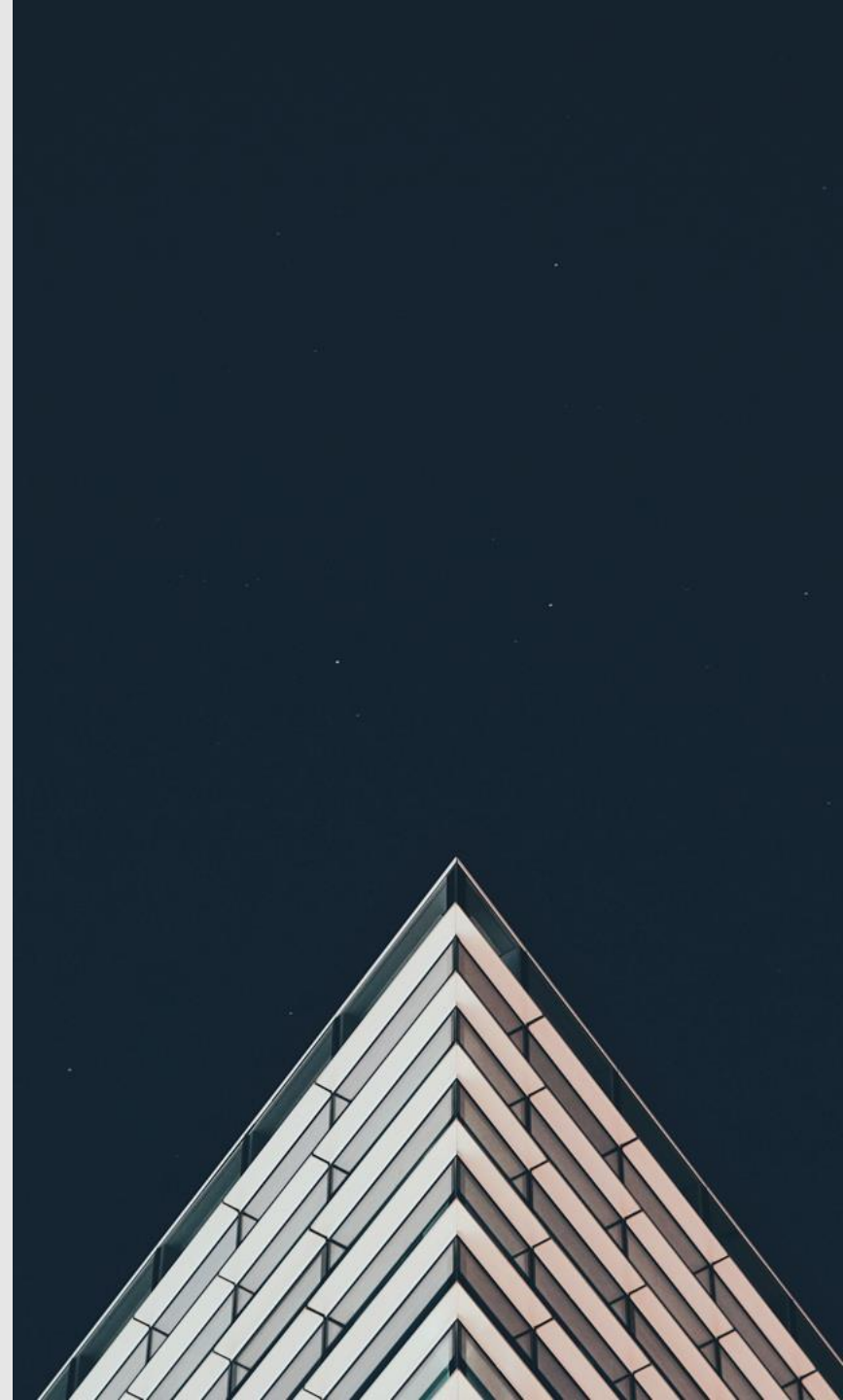
**Special Advisor**

...and many more

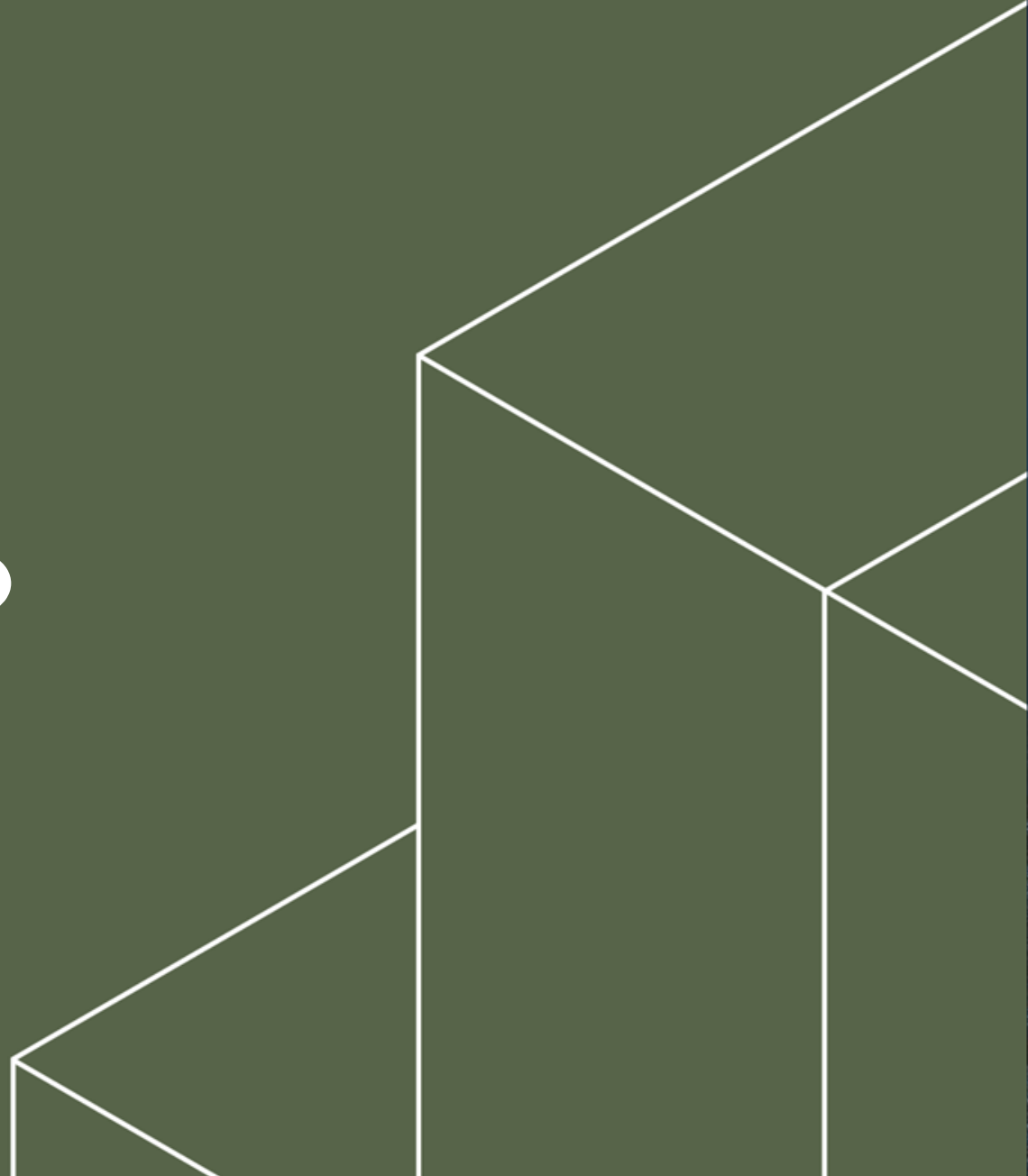


# Disclaimers

- These comments are the views of individuals as representatives of their organisations, and this report is our interpretation of what they have told us.
- Interviewees from each organisation were selected based on the **relevance of sustainable AI to their role**, so the topic was familiar at some level to all participants.
- Different roles look at sustainability and AI from different angles.
- Only organisations that have **some experience of AI** use were selected for this qualitative study.
- In this report, we have also included some of Solita's views on sustainable AI. Our thoughts are shown on pages with **white background**. These contents were not used in the interviews.



# What is [sustainable] AI?





**There is no consensus on how to  
talk about sustainable AI.**

**Or AI in general.**





# No matter the industry, the terminology is scattered.

- **Responsible**
- **Sustainable**
- **Explainable**
- **Ethical**
- **Trustworthy**
- **Lawful**
- **Robust**

These are all words used to describe an organisation's approach to what we call "sustainable AI." More often than not, the definition only reflects the thoughts of our participants and not the company as a whole.

In just a few cases, there seems to be a **clear definition organisation-wide** on what terminology to use and why.



**Sustainability** as a general term is most often connected with environmental matters, but when talking about **sustainable AI**, the focus is mostly on **social impact and data**.

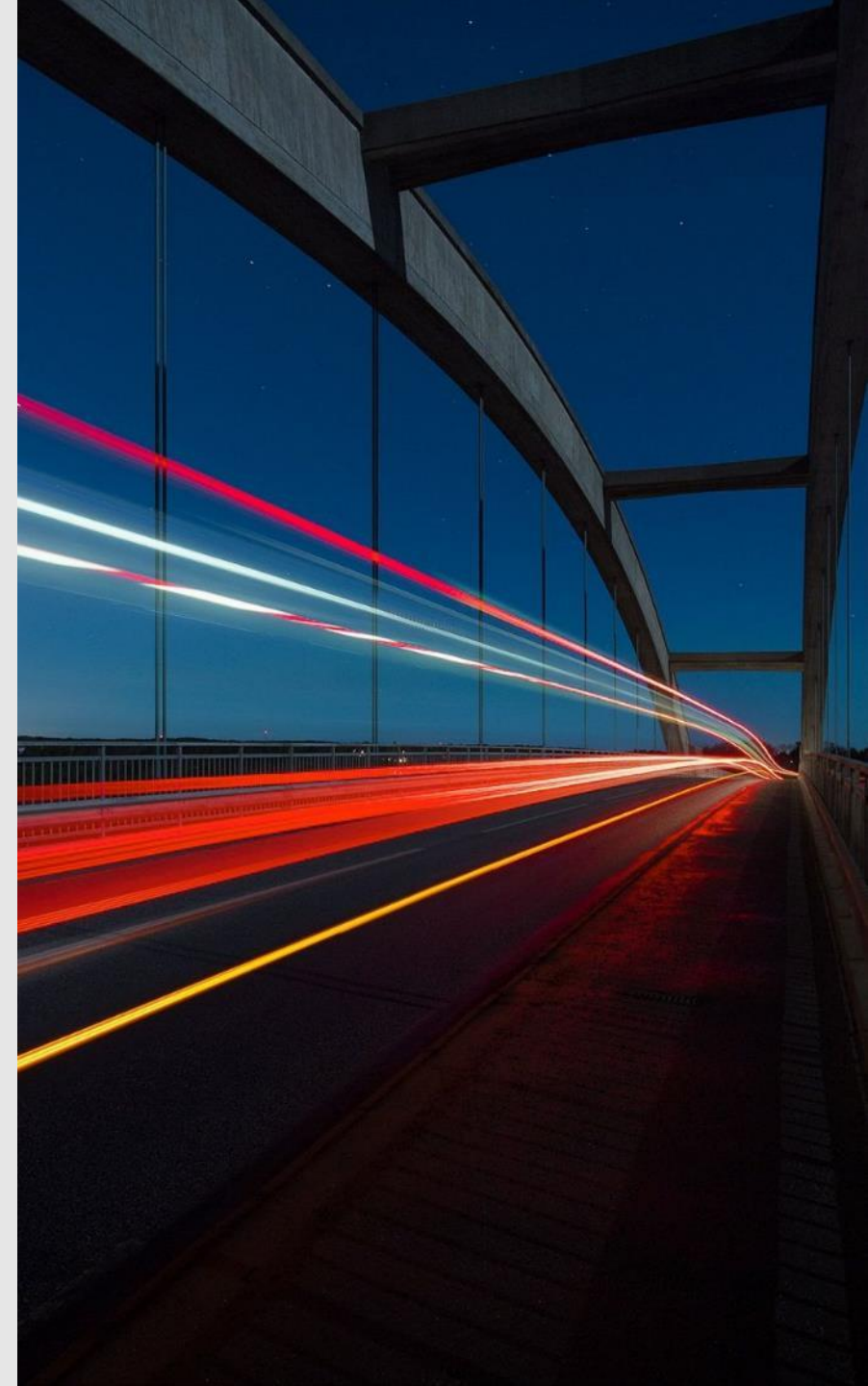
**Environmental themes** come into focus mostly with companies already directly associated with them.



In some companies and industries, the terminology is **not discussed at all**.

However...

**This not does mean that the organisation is not working responsibly or ethically.**





# Lack of terminology might be due to...

## 1. Responsibility being a core value.

The ethics or sustainability of AI has not been raised as a singular subject, but rather as a part of responsible operating procedures.

## 2. Low maturity in using AI.

Discussion isn't seen as relevant yet, mostly because the company is restricted either by regulation, culture, or lack of resources when it comes to implementing AI.

## 3. Lack of internal communication.

In some cases, the company has published policies and guidelines on the ethics of AI, but this seems to be more visible from the outside than from the inside.





Generally, we see the term **sustainable AI** used in two different contexts. Ours, and the one used in this report, is the latter.

### **AI for sustainability**

- AI as a tool for reaching environmental and social goals
- E.g. reducing logistics emissions by loading trucks optimally and planning routes to minimise kilometers driven

### **Sustainability of AI**

- AI as an entity that creates social, environmental, and economic impacts
- Fairness, accountability, transparency, explainability, and trustworthiness of AI systems





For us at Solita, **sustainable AI** refers to creating and operating **trustworthy AI systems** that deliver **long-term value** to business, people, and the environment.



Lasting business and customer value



Alignment with the organisation's strategy and values



Desirable social and environmental impact



Legal and regulatory compliance, privacy & security



**Artificial  
intelligence is  
just as hard to  
define by itself.**



# Most organisations shy away from the term “artificial intelligence” altogether.

They'd rather use words like....

- Machine Learning
- Chatbots
- NLP
- Analytics
- BI
- Automation
- Robotics
- Algorithms





Using more specific terminology than just “AI” creates **clearer expectations.**

AI as a term has baggage that not everyone wants to unpack.



**Does sustainable  
thinking scale with  
use of AI?**





**Heavily regulated  
fields and  
organisations are  
generally more  
mature in thinking  
about sustainable AI...**





**...but heavier use of AI and analytics does not always correlate with discussions of the possible impacts.**





# Why is this?

## 1. Lack of assigned responsibility

No one really knows who should be responsible for the sustainability of AI.

## 2. Lack of subject matter expertise

No one really knows who could be responsible for the sustainability of AI.

## 3. No perceived outside push

No legislative or stakeholder pressure, or no perceived negative impacts on reputation from lack of discussion.

## 4. “We don’t use AI”

The definition of AI is hard in itself. Because of this, some companies have not had the talk about the sustainability of AI: in their eyes, they are not using AI, even though the definition used e.g. in the EU AI Act would point otherwise.





**How often  
has talk  
matured into  
actions?**





“When it comes to AI, I don’t think that all the pieces are in place yet. That would require that **everyone in the organisation knows when to stop**. And I don’t think we’re quite there, because these things are far from easy.”





# Organisations' maturity on AI and AI sustainability

The number in each cluster refers to the number of interviewed organisations that belong to the cluster

Maturity of AI use

Operational use of AI  
Production pilots  
Proof-of-concepts

Not actively discussing AI sustainability      AI not separated from general sustainability/responsibility      AI-specific guidelines and principles      Sustainable AI by design

Maturity of AI sustainability

**The amount of organisations that have specific sustainable AI guidelines in place, or are actively developing them, is quite high.**

As with terminology, lack of guidelines does not necessarily mean lack of expertise or responsibility - it often means that AI is seen as a part of a larger whole.





**Only four organisations**, some of them public and some private, seem to have adopted clear processes to ensure that the guidelines are adhered to.

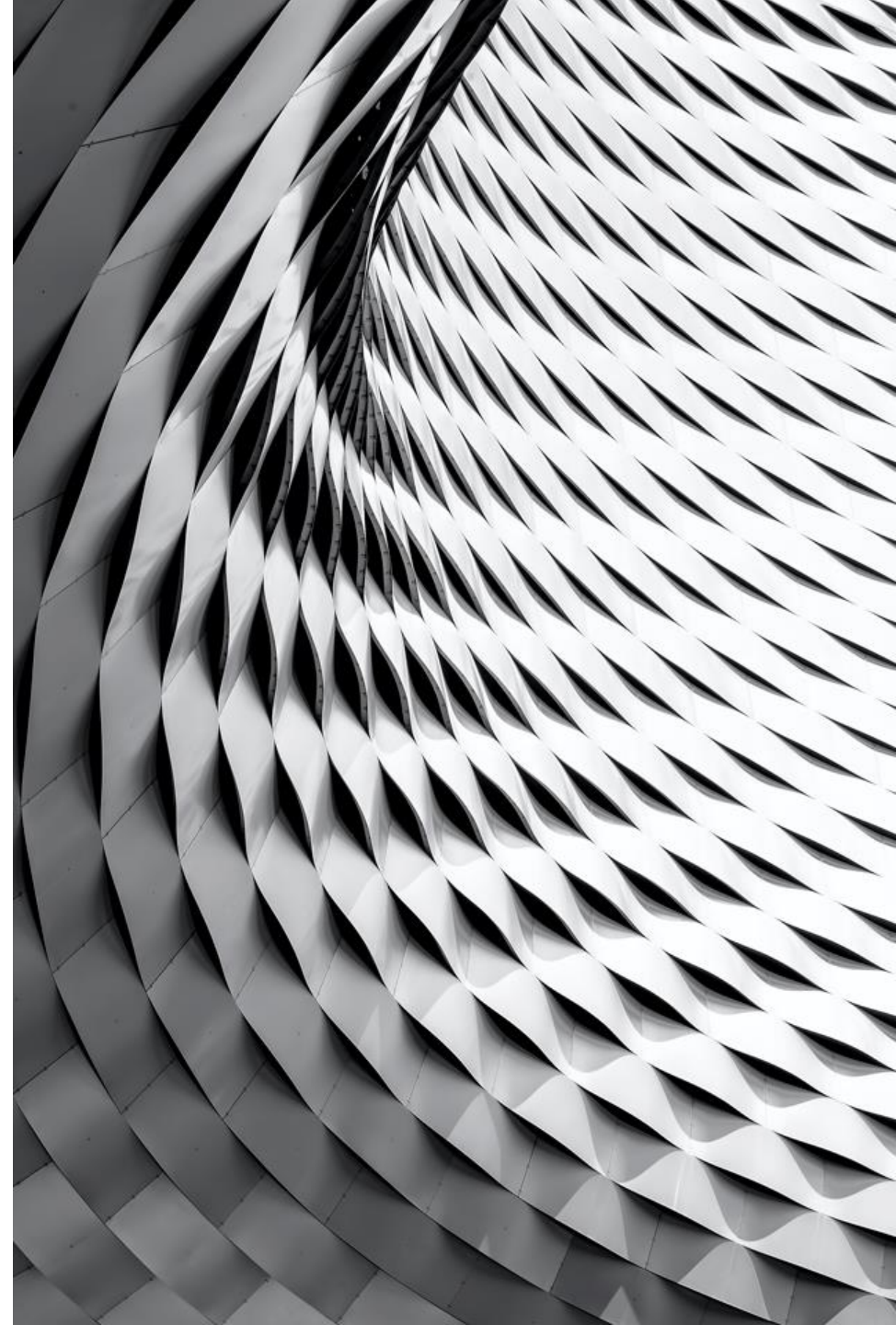




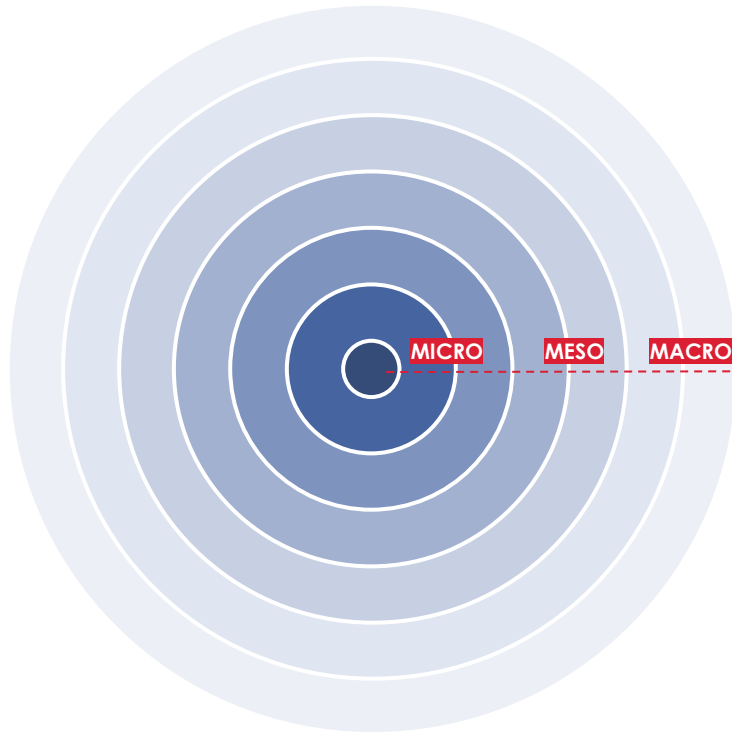
# How to assess the impacts of AI systems?

One example on how we approach the subject is Solita's **Layers of Impact** framework.

This framework is used in the early stages of use case definition, to identify and analyse potential direct and indirect impacts of the intended solution. The model is then used periodically throughout the system's life cycle to assess and identify actual and potential impacts of the solution.



# Layers of Impact




**CASE** <the use case to be assessed>

1. **Layers:** Identify what the layers represent in this use case.
2. **Value:** Identify factors that help to create value/fit on each layer.
3. **Risk:** Identify factors that reduce value, create potential risks, or lead to unethical results on each layer.
4. **Activities & metrics:** What needs to be investigated or validated, and how, in order to design the best possible solution with sustainable value? What can be measured to identify realised impact after deployment?


### END-USER & CONTEXT

Definition:

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---

Design activities & key metrics:


### ORGANISATION

Definition:

---



---



---

Design activities & key metrics:


### SECONDARY PARTIES

Definition:

---




---




---

Design activities & key metrics:

### CULTURE



---




---

Design activities & key metrics:

### SOCIETY



---



---

Design activities & key metrics:

### ENVIRONMENT



---



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Design activities & key metrics:



FIT or VALUE → **Design to enhance**



RISK or THREAT → **Design to mitigate**

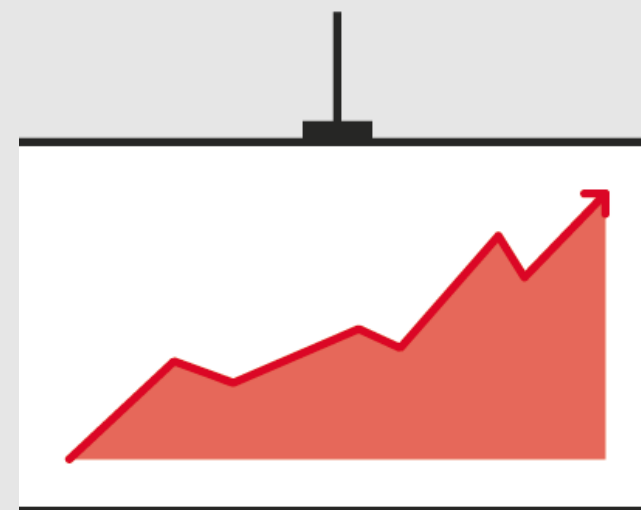


# What drives sustainable AI?



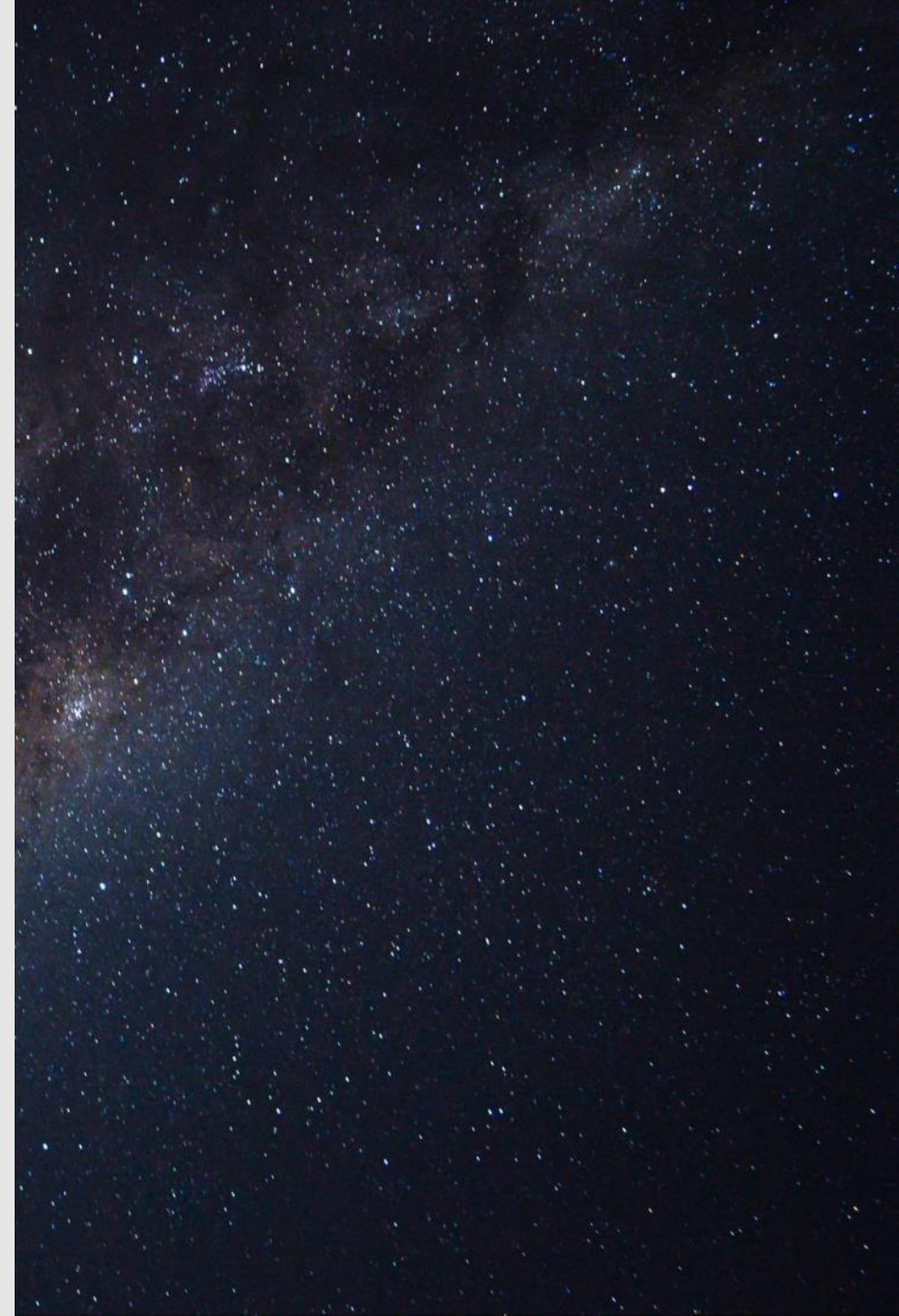


“We don’t want the conversation to be compliance-based. It’s naive to think that an organisation like us wouldn’t fall into the scope of critical AI applications. **We want to stay ahead of the curve, stay humble, there’s lots of uncertainty.**”



**Many organisations want to be seen as frontrunners in sustainability and responsibility.**

This is the number one driver for **business in general**, but the desire and vision are not yet necessarily visible in **sustainable AI specifically**.





**“I think about it all the time, but just me thinking about it is nothing, it doesn’t take us very far. If we think about sustainability in general and things like ethics, we want to be the frontrunners.”**





## Other drivers include...

- a) Pushes and nudges from society
- b) Regulation and law
- c) Value creation



# Society and change

- Politics and city policy
- Technology push
- Changes in behavior
- Attracting talent

Organisations feel like they **can't afford not to react** to the changing world around them. Even though technology is making huge leaps, it's only one of the driving forces behind a larger scale change. Politics is one of these forces, as are the changing values of (potential) employees. Sustainable use of AI has been a big talking point for the last few years, and defining what it means can help navigate these changes not only now, but also in the future.



“One thing to think about is how to make fair AI that is also **politically neutral**.

The government changes every four years and they get to decide their focus and emphasis. The basic ethical principles can't be swayed by whoever happens to sit in the big seat.”



“**The industry is in a turning point.** Machines are getting smarter, more digital and electric. These are the drivers at this moment.

It simply would not work if everyone did everything by themselves. We look at technologies with a wider lens, so that not everyone has to reinvent the wheel.”



# Regulation and law

- EU AI Act
- Other laws and regulations
- Role in society
- Audits

The organisations who have familiarised themselves with the EU AI Act are more often than not actively preparing for it by building guidelines. These organisations usually operate in already heavily regulated fields, where their **critical role in our society** holds them responsible in a way some commercial organisations have yet to face.





# Value creation

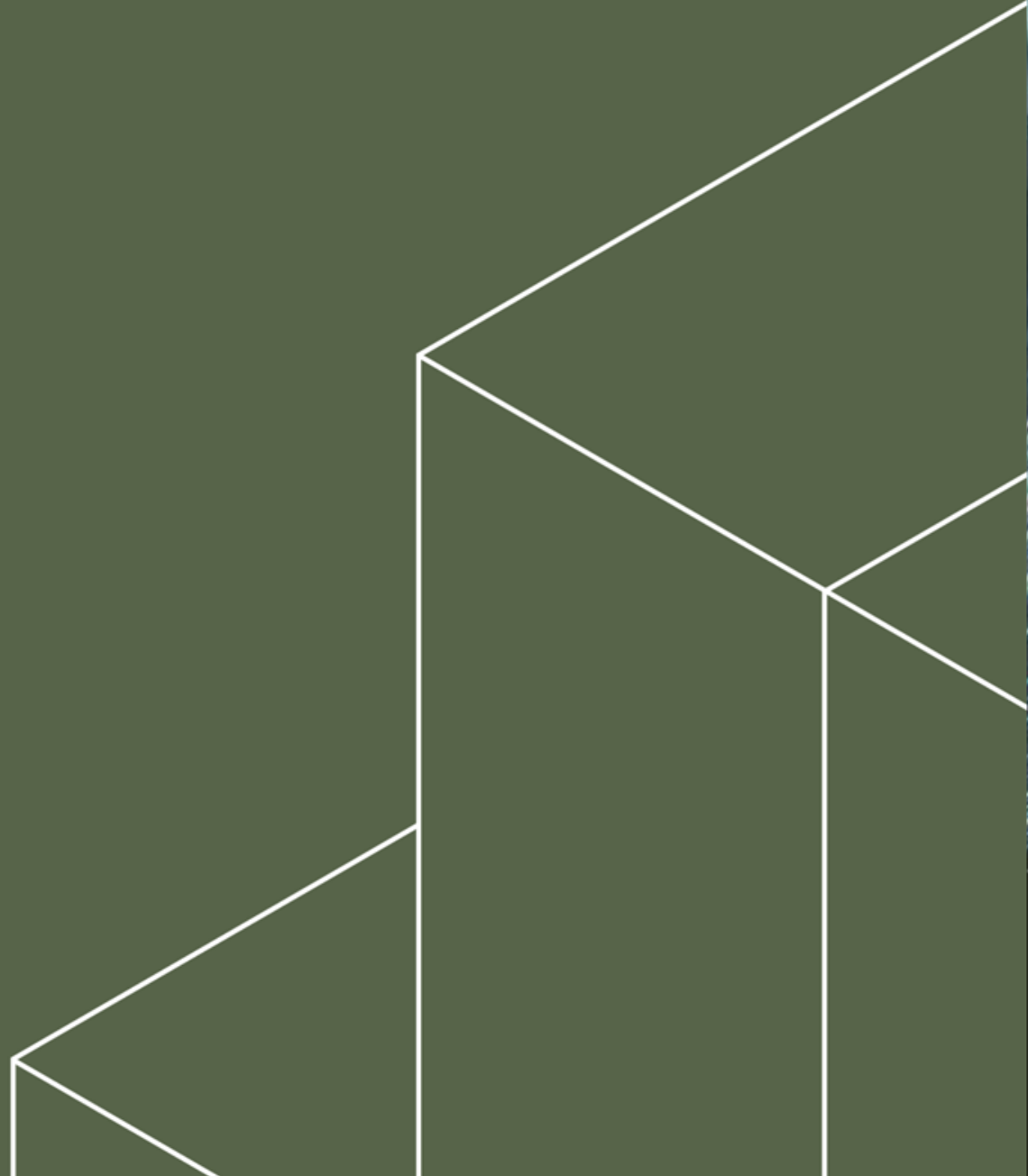
- Conscious consumers
- Brand image
- Participation and contribution
- Increase in trust for AI

Organisations mostly see AI as a valuable tool, but it is still widely regarded with suspicion - or not thought about much at all. With proper awareness, clear guidelines for responsible business practices, and actively participating in conversations in society, organisations feel that they can **create value not only for customers, but employees and stakeholders alike.**

“One of our starting points was to improve trust towards AI in our sector. There is a huge amount of expectation and suspicion, people are waiting for something bad to happen and not thinking about [possible benefits].”



**Who has the  
responsibility?**





**If there is no clear definition of sustainable AI, responsibility for it can be very difficult to assign.**

**How have different organisations handled this?**





# Personified responsibility



## “I suppose that would be me.”

- This usually means there's **very little talk** in the organisation about sustainable AI.
- The subject is taken **very seriously by individuals**, but it's hard to take the conversation further in the organisation.
- There is a recognised lack of subject matter expertise in the organisation.

## Head of Sustainability

- High subject matter expertise in ethical business practices, but **not necessarily in AI**.
- The organisation may have principles in place for sustainable AI, but rarely processes.
- Despite having guidelines, there may be a lack of widespread awareness and concrete actions.

## Expert on Sustainable\* AI

- A few organisations have people dedicated to sustainable\* AI.
- These organisations usually have a high level of maturity when discussing **impact and processes**, but the maturity of using AI varies.
- These dedicated roles do not work alone, but are often part of a decentralised model or a team.

\* or ethical/responsible/trustworthy...



# Shared responsibility (or none at all)



## Business units / teams

- The **most common way** to deal with the subject is to decentralise it.
- Most often this includes organisations who **don't really separate AI sustainability** from other sustainable and responsible business & development activity.
- Despite this, they often **employ subject matter experts or have processes in place.**



## Ethical boards

- Boards or round tables usually **work in cooperation** with either business units or the individuals that are responsible for sustainable AI.
- Such boards are still relatively rare. They often include lawyers in addition to subject matter experts.



## No clear responsibility

- This category often overlaps with either “I suppose that would be me” or the decentralised approach in units / teams.
- Key difference is that there is **no subject matter expertise or concrete knowledge of the situation within the organisation**, but mostly guesses on where the responsibility might lie.



The most mature organisations rarely have just one of these categories in place, but several.

No expert can (or should!) carry the whole responsibility alone. It needs to be a practice that spans across all levels of the organisation, taking into account the views of a diverse group of experts.

An expert on AI is not necessarily an expert in diversity or sustainability, and vice versa.

**What are the  
key challenges?**







**The challenges organisations face at this point in time are mostly due to**

- a) People and culture**
- b) Procedure and law\***
- c) Data quality and access**

**\*which no one complains about, despite the challenges**



# People & Culture

- Leadership
- Lack of resources
- Lack of subject matter expertise
- Mistrust



**“If we aspire to go beyond risk management, culture is key. It’s not about building compliance structures, but about empowering people to ask the right questions at the right time.”**





# Any big adjustment in an organisation requires leadership and investment.

If the organisation's leaders are not willing to consider, commit to, and invest in sustainable AI, there is very little the lone subject matter expert can do.

Convincing the leadership of the **business benefits of sustainable AI**, not only for their brand reputation but for long-term profitability, is a key issue in those organisations who are still finding their way.

The discussion between ethics and profit is still very much a relevant issue, and it's not a zero-sum game.



# Both leadership and culture in general face challenges in **communicating** about difficult issues.

The language used in an organisation can tell a lot about how they view things. If talk of sustainable AI is shrugged aside as irrelevant, it is usually due to lack of understanding rather than any intent on doing harm.

**Finding a common language and terminology** within an organisation will not only help the leadership, but alleviate the fears that employees might have due to misunderstandings and mistrust.

These fears might include e.g. added workload due to new processes. There is a need to effectively communicate the importance and benefits to all involved.



# You cannot change what you don't understand.

This has to do with not only the language, but the whole concept of artificial intelligence. If an organisation doesn't employ or consult experts, it's impossible to build a solid foundation for sustainable AI. This includes both **experts on AI** and **experts on the sustainability and responsibility of AI**.

Many organisations **find it hard to recruit these experts** even if and when they try. In these cases it comes down to building internal capacity, which in turn requires considerable investment and outside resources. Building a strong brand in sustainable AI can help attract talent in the future.



# We at Solita believe sustainable AI is sensible business.

## Profitable investments

Heightened **awareness of the benefits and potential harm** caused by AI systems helps to:

- allocate resources wisely
- solve problems holistically
- deliver solutions to a wider, diverse customer base
- ensure value realisation
- protect brand reputation

## Operational excellence

Adopting an AI operating model and technical enablers that **streamline the lifecycle of AI systems** leads to:

- reduced operational costs
- ability to quickly mitigate issues
- improved ability to comply with audits
- reduced risk of compliance fines

## Competitive advantage

**Commitment to responsible and sustainable AI** enhances:

- customer satisfaction and loyalty
- access to scarce talent

## Future-proof AI solutions

Increased **transparency, accountability, and auditability** improve the ability to:

- comply with future regulations
- adapt AI systems for future requirements



# Procedure and law

- High business standards
- High regulation





# Many organisations are **highly regulated** in what they can do, which dribbles down into **sustainable AI as well.**

A high level of awareness of potential risks is typical for organisations that face high regulation and legal limitations in their everyday work. Even though they admit that this is a challenge, it's not a complaint.

Again, what emerges as a frustration is the **interpretation of terminology**. When organisations need to be sure of what they can and can't do, and there is no clear definition of what falls into the category of AI or sustainable AI, they'd rather not take many steps at all. This can and does interfere with innovative development.



# Data

- Data quality
- Data access
- Data privacy
- Data security



# Data challenges are present not only in the use of AI, but sustainable AI as well.

Especially organisations who are higher in AI maturity recognise that it's not only the quality of data that is important, but who has **access** to it. **Data bias** is a well-known and recognised issue, but ownership becomes a key element when dealing with IT companies and outsourced solutions. **Data privacy and security** are matters that companies are very familiar with through e.g. GDPR, but may sometimes pose challenges to building solutions.

Due to ethical concerns, many organisations are not willing to share their data. If the organisation does not have an internal capacity to build solutions, they need to buy elsewhere, and are often faced with a brick wall when wanting to **buy just the solution without providing data**. Partnering with an external provider for customised sustainable solutions is an alternative path.

**What are  
organisations most  
worried about?**





**The biggest worries regarding the use of AI have to do with...**

- a) Transparency and explainability**
- b) Data bias**
- c) Misuse of data**
- d) Collateral damage**



# Transparency and explainability

This is a hugely important issue for organisations, and also the one they have quite a lot of trouble with.

Even those with clear processes and guidelines struggle with transparency.

# Issues with transparency can be divided into...

## 1. Transparency within the organisation

AI solutions that affect the work of employees need to be explainable even to those not well versed in the matter. What is this solution doing and why?

## 2. Transparency towards the public

The same applies to solutions directed to the public. Consumers should be able to understand why and how decisions affecting them have been made.

## 3. Transparency of outsourced solutions

Black boxes are an issue to companies wishing to buy solutions off the shelf.





# Data bias

Organisations are very much aware of the potential risks that come with biased data, but they are not always sure how this could manifest itself in their business context.

Race and gender are among the most talked about subjects.





“This one word you said, bias. I wonder how it would pop up here. It could be a business bias, more than anything related to gender or such. Makes one think. **Maybe we haven't thought about this enough.**”

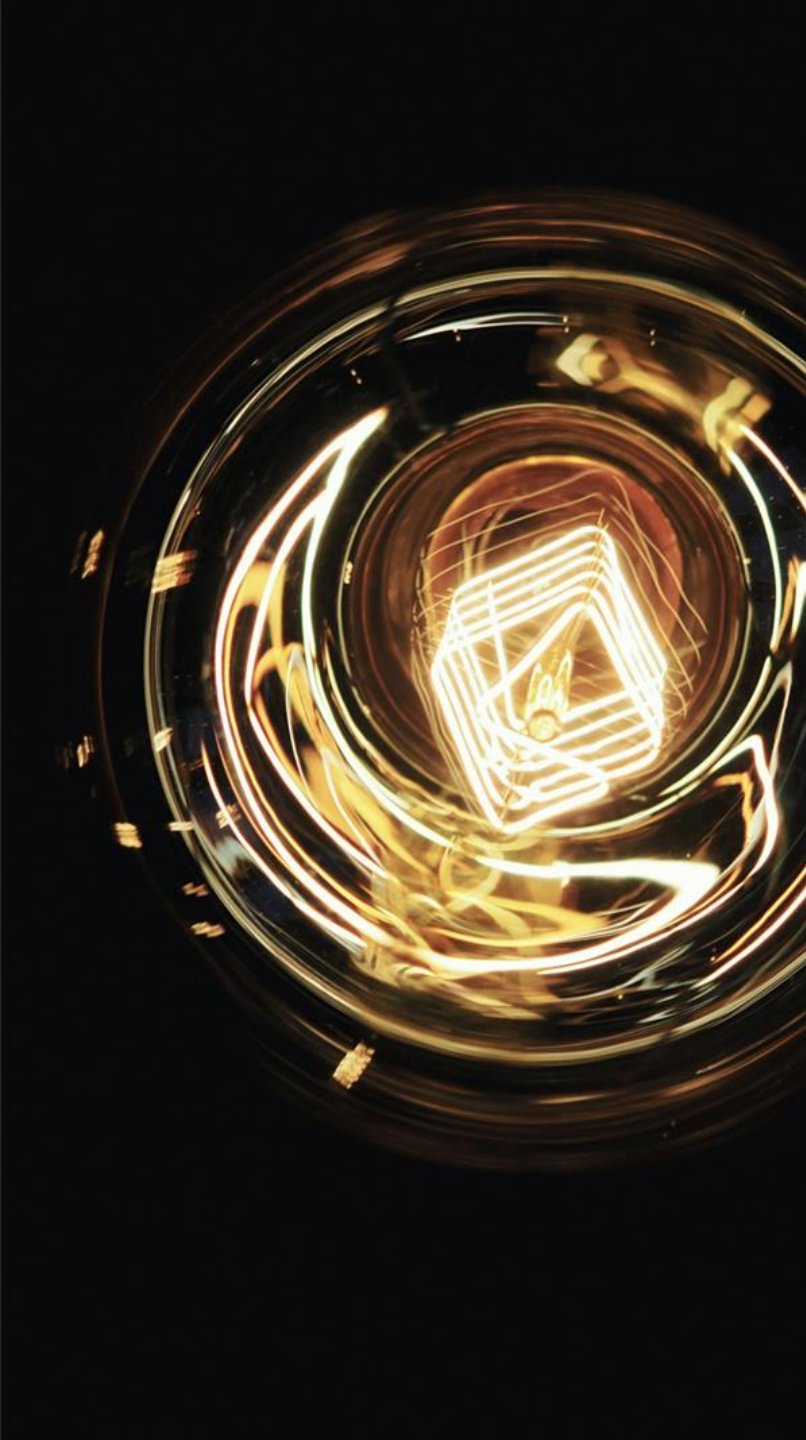




# Misuse of data

This is very much a human issue. What data is used and why, and what is the final result used for and how.

Misuse of data does not need to be malicious to be frightening. Organisations are worried about lack of expertise and lack of understanding of e.g. privacy issues, which might lead to serious consequences.





# Collateral damage

There is also some talk and worry within the organisations about **what will happen to jobs** with increased use of AI and automation.

One company openly admits that this has **already been the cause for some layoffs**, while a few hint at this.

For most, it is still a **theoretical worry**, but one that is strongly rooted within the minds of people.

# Strategy and vision for sustainable AI





**Most** organisations incorporate AI strategy into data strategy.

**Some** have no strategy related to AI at all.

**A few** have a separate strategy for sustainable\* AI specifically.

\* ethical/responsible/trustworthy...



**Organisations that have a separate strategy for sustainable AI usually have principles and guidelines in place as well.**

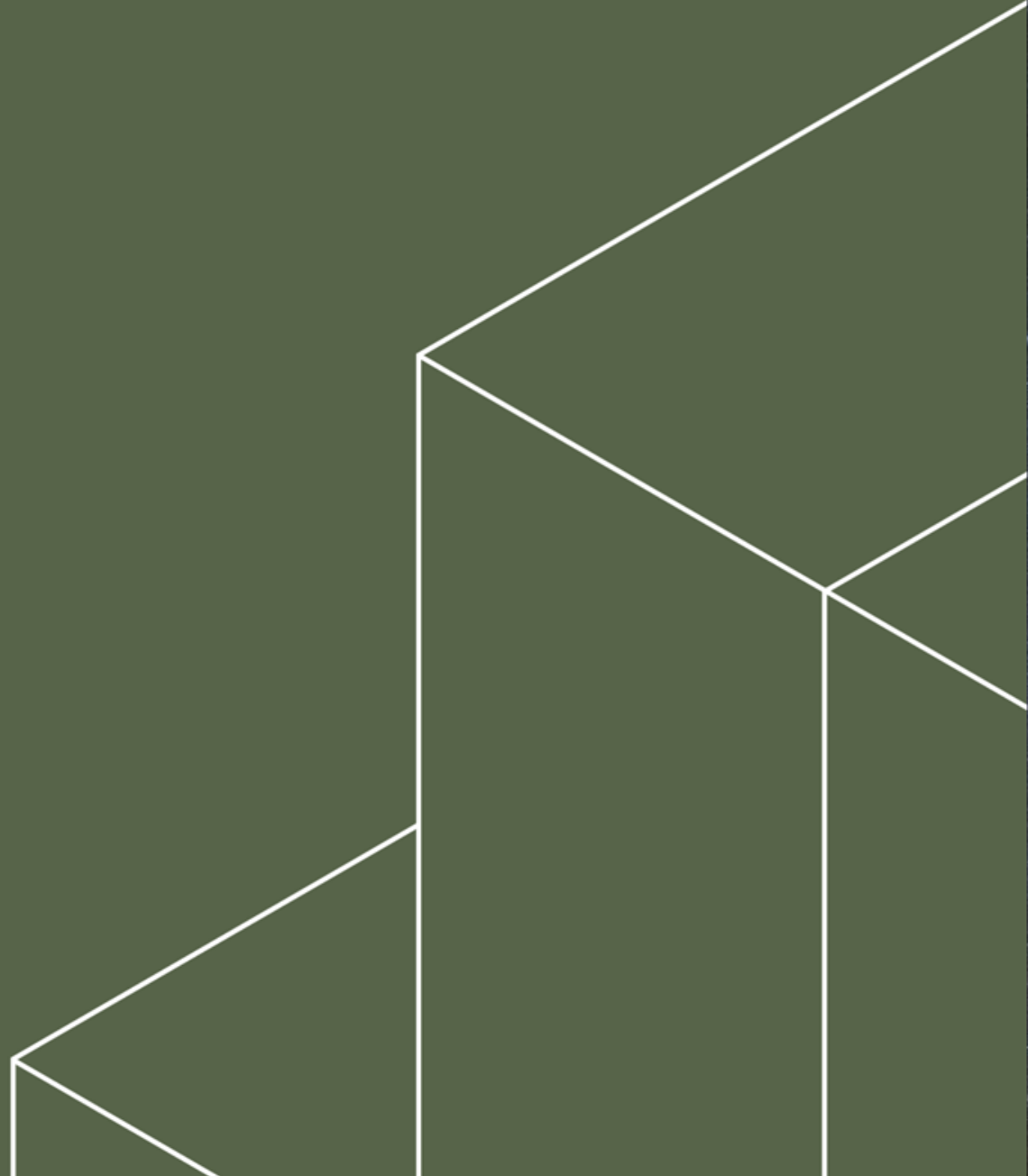
However, the existence of guidelines does not guarantee that they show up in strategy.

**Incorporating AI into data strategy is the most common approach - and a sensible one.**

However, data strategy singles out ethics or sustainability guidelines more rarely than an AI strategy. Following existing regulations, such as GDPR, seems to suffice.



# Thoughts on the EU AI Act







# Preparations for or discussions on the upcoming AI Act are still quite rare.

**Most** have not heard about it or if they have, it was not talked about within the organisation

**Some** have looked into it or heard it talked about within the organisation

**A few** actively participate in or prepare for the Act



**In preparation for the AI Act, organisations should be aware of the wide range of techniques and approaches included in the definition of “artificial intelligence”.**

The scope of the **AI Act Proposal, published in April 2021**, spans e.g. Machine Learning, logic- and knowledge-based approaches, statistical approaches, and search and optimisation methods.

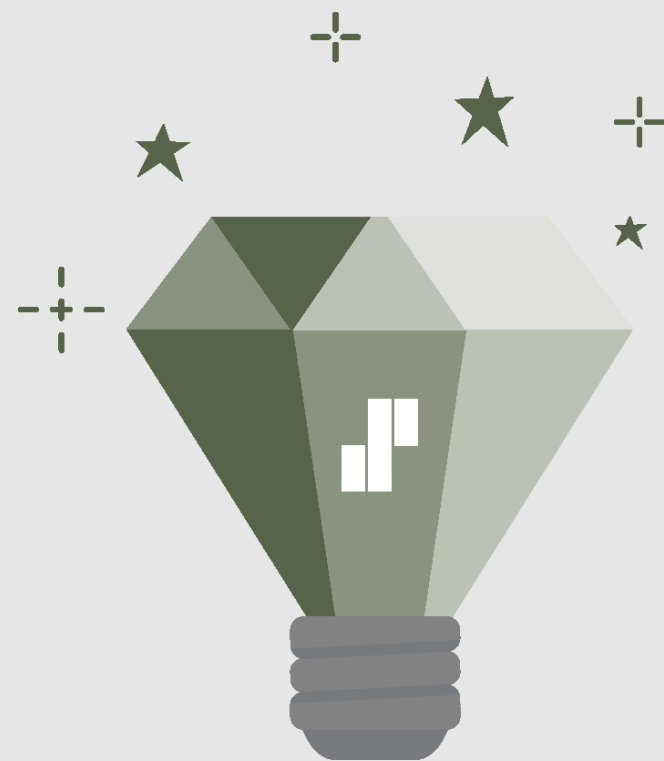


**The AI Act is most actively discussed or even participated in by fields that are highly regulated and/or in the high risk category, as was the case for guidelines on sustainable AI.**

Even those who have very little discussion on the subject agree that they **should be more aware** of what's coming.

**What kind of  
collaboration is  
needed?**





**By far the biggest need is in understanding the subject matter and creating processes for sustainable AI.**

The topic of the interviews might have nudged some respondents to give this answer, but the need is clearly there. Organisations were often becoming increasingly aware of this over the course of the interviews.



**“I guess the departure point would be to build a model, we don’t have the expertise for that. That would lead to roadmaps and action points, assigning responsibilities within the organisation. — We need outside help straight from the get-go, to **define this whole thing.**”**





# Organisations often have no internal capacity to...

- 1. Understand sustainable AI**
- 2. Build competence**
- 3. Create frameworks and processes**

Without internal expertise, organisations may have an idea of what they have to do, but very little tools to actually get it done in an impactful way. The same applies to building competence: it requires either external help or recruitment of new talent, which can be a challenge in itself. Frameworks and processes are unlikely to be adopted effectively without sufficient understanding and competence in the organisation.









**Cultural transformation** is one of the greatest challenges that organisations face. It has to do with not only leadership and capabilities, but building a culture where sustainable use of AI is ingrained in the everyday practices.

This requires not only people who understand the subject matter, but know how to bring about change. Both **human insight and technical expertise** are needed in the cultural transformation of embedding a sustainable AI mindset and ways of working.



# Conclusion





# There is no one right way to do sustainable AI.

What is needed is a recognised **motivation**, a shared **vision**, and strong **collaboration** across the organisation.



# Sustainable AI by design is achieved through collaboration across the strategic, tactical, and operational functions.



## Setting clear goals

- Sustainable AI education
- Sustainable data & AI vision and strategy
- Principles of responsible use of data & AI

## Building the framework

- Data & AI governance model
- Impact and risk management framework
- Human-centric AI design principles
- Sustainable AI use case identification and assessment
- Responsible AI standards & certificates

## Embedding the practices and technologies

- Data & AI operating model
- Scalable technical enablers (e.g. MLOps)



# Here are our key recommendations for future-proofing use of AI in your organisation.

- 1) Involve all relevant stakeholders in the discussion on **why AI sustainability is important** to your organisation. Diversity is key!
- 2) Define **responsibilities and mandate** for advancing the topic.
- 3) Take action to increase **awareness and understanding of AI sustainability** at all levels of the organisation, starting from leadership.
- 4) Assess your organisation's **sustainable AI maturity** and plan the next steps accordingly. Use external expertise where needed to get you up to speed.

# At your service



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