



# DATA DRIVEN FINANCIAL STABILITY

#datadrivenstability  
#financialstability

2–3.12.2019

OPPORTUNITIES  
AND CHALLENGES  
IN BIG DATA





# Saidot

**Understanding the new risk in  
complex technologies**

Data Driven Financial Stability 2.12.2019  
Meeri Haataja, @meerihaataja

saidot.ai

# Meeri Haataja

[@meerahaataja](#)  
[meeri@saidot.ai](mailto:meeri@saidot.ai)

- CEO & Co-founder of Saidot
- Chair of IEEE's Ethics Certification Program for Autonomous & Intelligent Systems
- Affiliate at the Berkman Klein Center for Internet & Society at Harvard University (2019-2020)
- Previous chair of Ethics working group of Finland's AI Program
- Over 18 years of experience in driving data, analytics and AI use as well as privacy in large enterprises in financial services, telecommunications, high-tech and media.



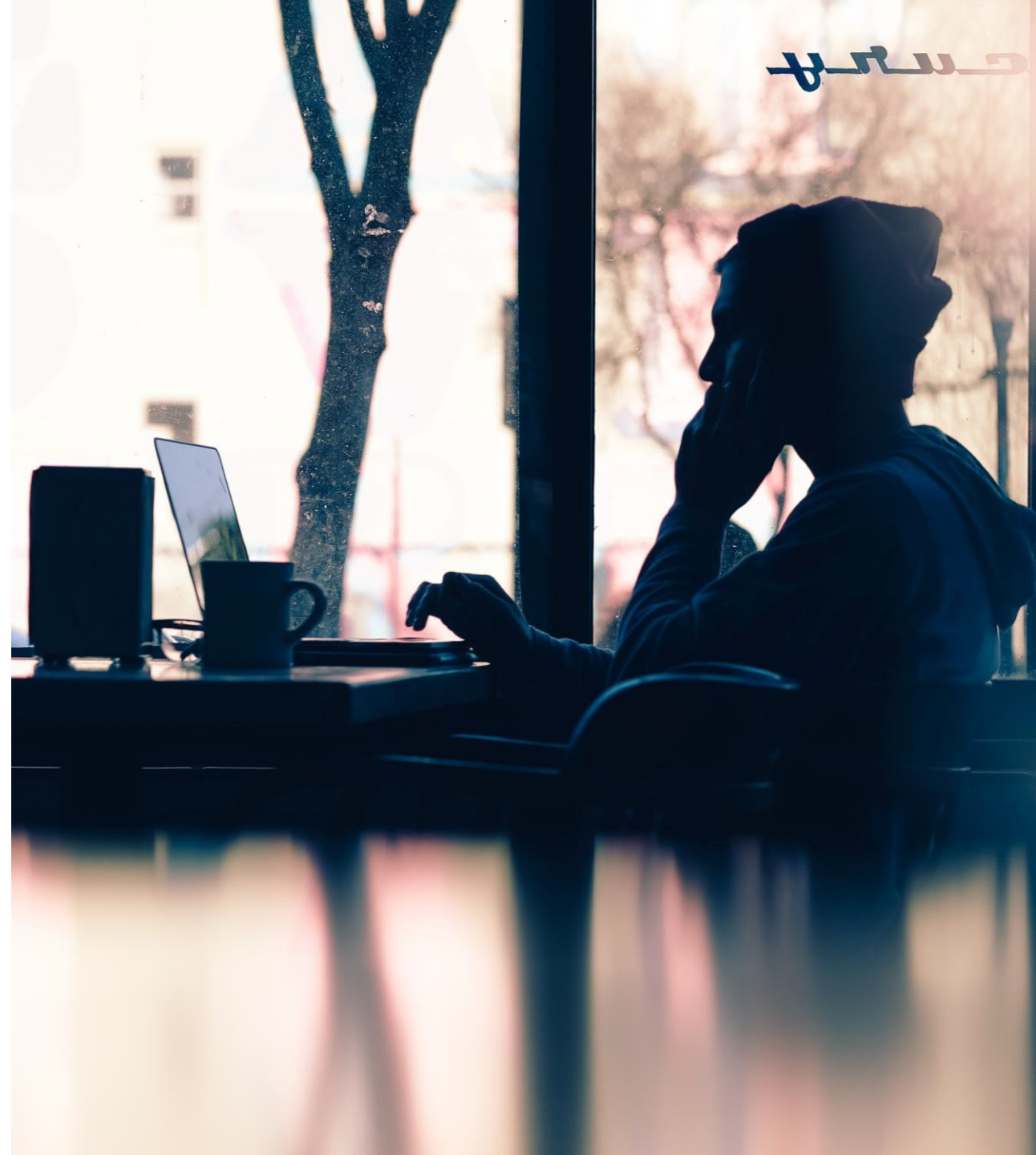
## Discussion themes

AI and the new business risks

Overview on ethical AI

Task list for AI governance

Case examples



# State of AI in Financial Services

70%

Machine Learning

**Predicting cash-flow** events and proactively advising customers on spending and saving habits

Expanding the data set for developing **credit scores** and applying machine learning to build advanced credit models for expanding reach and reducing defaults

Providing machine-learning-based **merchant analytics** “as a service”

Detecting patterns in transactions and identifying **fraudulent transactions** as early as possible

60%

Natural Language Processing

Reading documents and identifying errors for support activities such as **information verification, user identification, and approvals**

Improving the **underwriting** process and capital efficiency

Understanding **customer queries** via voice search on digital voice assistants or smartphones

52%

Deep Learning

Reading claims documents and **ranking their urgency, severity, and compliance** to expedite triage

Building **dashboards** that provide users with data analytics in a simple and intuitive format

Developing innovative **trading and investment strategies**

58%

Computer vision

**Classifying drivers** based on their attention levels—safer drivers can then be targeted to offer **lower premiums**

Building **biometric security** for clients in a secure environment, such as for bank ATMs

Providing investors and traders with immersive experiences for making **portfolio allocations and trading decisions**

# AI leader, the riskiest job role of our time?

“ Apple’s credit card is being investigated for discriminating against women

Facebook and Google’s pervasive surveillance poses an unprecedented danger to human rights

Berkeley Becomes Fourth U.S. City to Ban Face Recognition in Unanimous Vote

*Police Use of Facial Recognition Is Accepted by British Court*

Facial recognition in school renders Sweden’s first GDPR fine

Finnish Immigration Service to pursue a considerable reduction of processing times

Governments’ use of AI in immigration and refugee system needs oversight

**Can AI Be a Fair Judge in Court? Estonia Thinks So**

**How technology liberated China’s Uighur minority—and then trapped them**

Austria’s employment agency rolls out discriminatory algorithm, sees no problem

**Police trial AI that 'spots child abuse cases 10 times faster' than existing systems**

**Is it right to use AI to identify children at risk of harm?**

A blurred office environment with several people working at desks. In the foreground, a man in a green shirt is partially visible on the right, looking towards the left. Behind him, a woman in a blue top is seen from the back, and another woman in a floral patterned top is further back. The background shows office desks, computers, and large windows.

Why do companies  
and government  
agencies invest in AI  
ethics & governance?

Financial risk

Social responsibility & trust

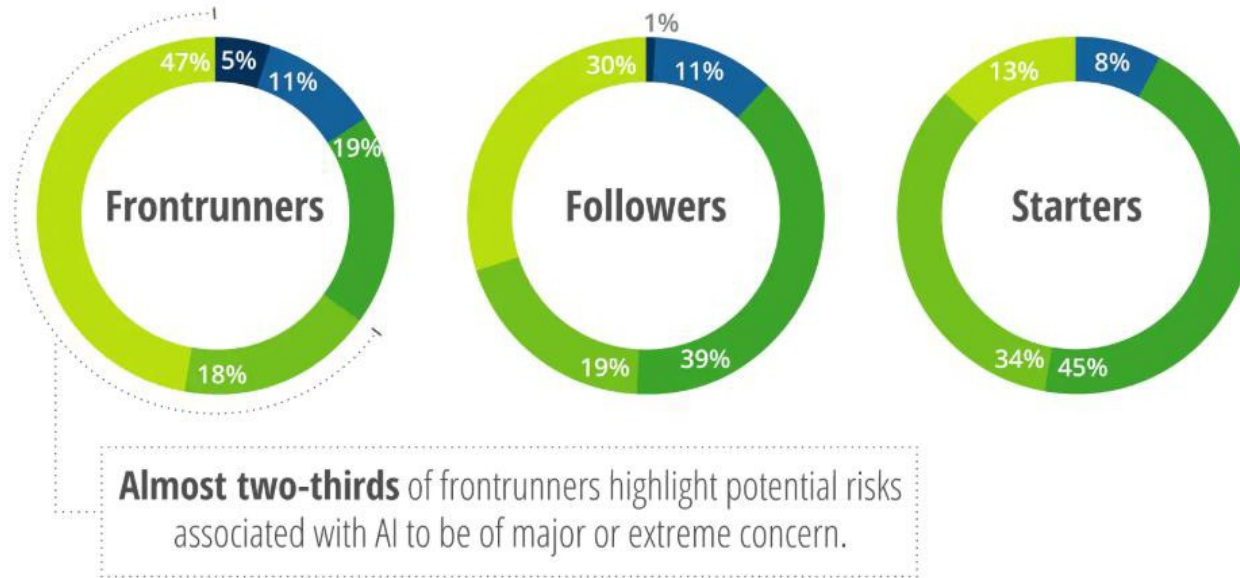
Compliance

Contractual requirements

## Divergence in risk estimation for different segments

Companies' investment in AI/cognitive

■ No concern ■ Minimal concern ■ Moderate concern ■ Major concern ■ Extreme concern



Source: Deloitte Center for Financial Services analysis, based on Deloitte Services LP "State of AI in the Enterprise," 2nd Edition survey, 2018.



## Top risks of AI that each respondent segment is most concerned about

| AI risk  | Frontrunners | Followers | Starters |
|--|--------------|-----------|----------|
| Cybersecurity vulnerabilities of AI/cognitive                                  | 1            | 2         | 1        |
| Making the wrong strategic decisions based on AI/cognitive recommendations     | 2            | 1         | 3        |
| Regulatory noncompliance risk  | 3            | 3         | 4        |
| Erosion of customer trust from AI/cognitive failures                           | 4            | 5         | 7        |
| Ethical risks of AI/cognitive  | 4            | 4         | 6        |
| Legal responsibility for decisions/actions made by AI/cognitive systems        | 6            | 5         | 2        |
| Failure of AI/cognitive system in a mission-critical or life-and-death context | 7            | 7         | 5        |
| We have no concerns about potential risks of AI/cognitive                      | 8            | 8         | 8        |

Note: Respondents were asked to select up to three risks and rank them in order of concern, 1 being that of highest concern.

Source: Deloitte Center for Financial Services analysis, based on Deloitte Services LP “State of AI in the Enterprise,” 2nd Edition survey, 2018.

## Tomorrow's fears ...

Over the next five years, executives are concerned about the following threats:



1. Identity Theft Resource Center, [Data Breach Reports](#), October 31, 2018.

2. Council of Economic Advisors, [The Cost of Malicious Cyber Activity to the U.S. Economy](#), February 2018.

3. [2018 Edelman Trust Barometer](#).

4. Department of Defense Fiscal Year (FY) 2019 Budget Estimates.

5. Indeed Hiring Lab, [Demand for AI Talent on the Rise](#), March 2018.

6. CB Insights, [Artificial Intelligence Trends To Watch In 2018](#).

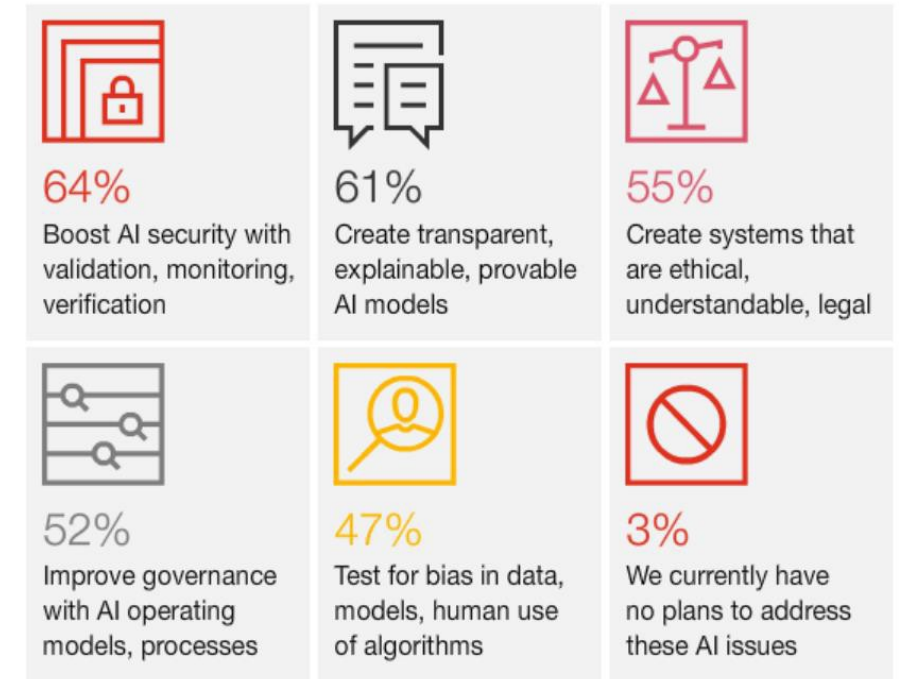
Source: PwC 2019 AI Predictions

Base: 1,001

Q: Which of the following scenarios around AI do you perceive as a real threat in the next 5 years?

Source: [PwC 2019 AI Predictions](#)

## Taking steps toward responsible AI



Source: PwC 2019 AI Predictions

Base: 1,001

Q: What steps will your organization take in 2019 to develop and deploy AI systems that are responsible, that is, trustworthy, fair, and stable?

# Synthesis of the AI ethics guidelines



Lawful



Value driven,  
principled



Technically  
robust



Risk-aware

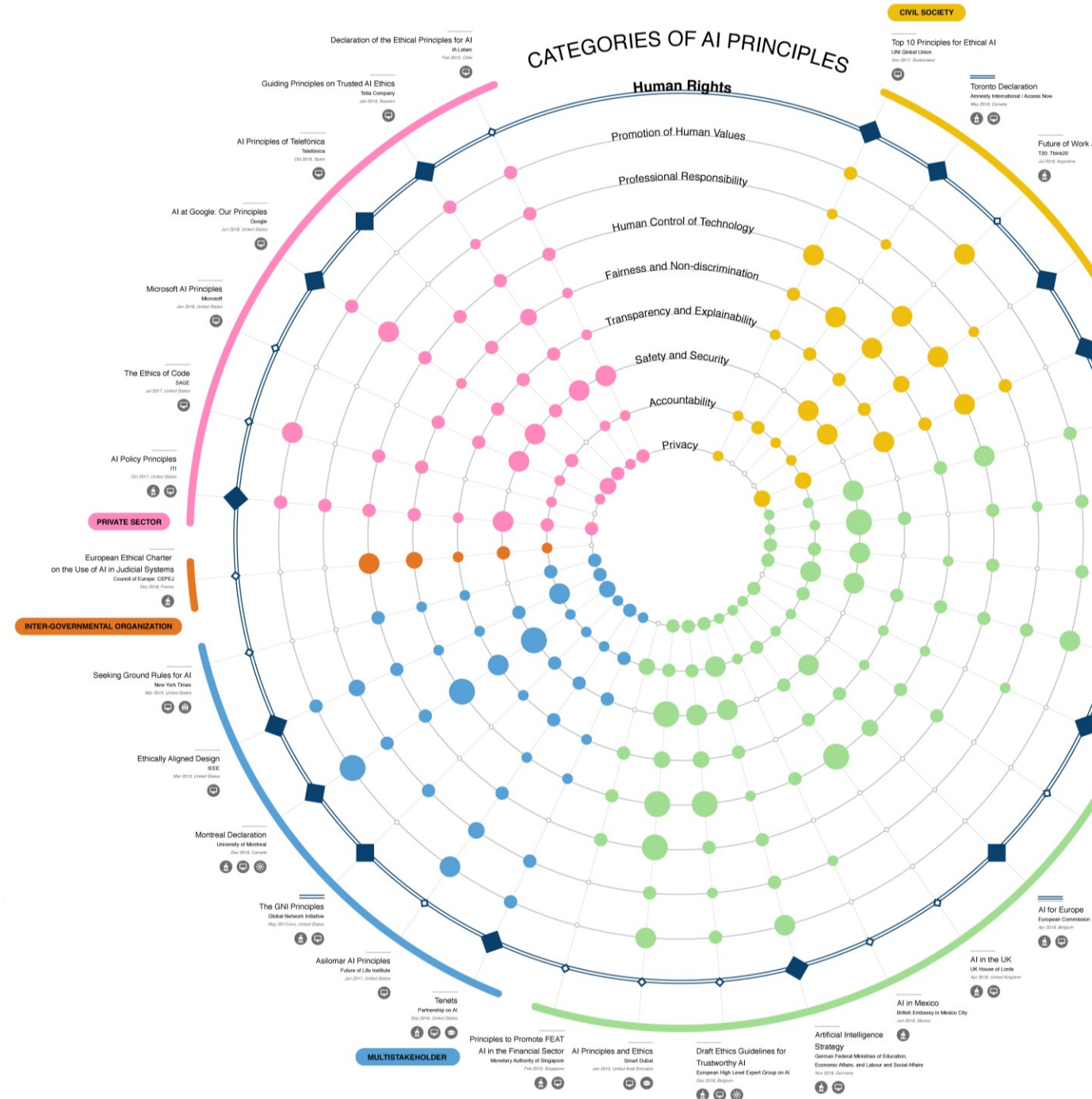


Over the  
lifecycle

## Principled AI

# How to achieve human-centricity & trust in AI;

- **Human agency:** Users should be able to make informed decisions regarding AI systems.
- **Transparency, explainability:** AI should be transparent regarding the data, the logic of the system and the business models.
- **Accountability:** Clear human responsibility and accountability for AI systems and their outcomes should be guaranteed.



# A task list for AI governance

## ETHICS PRINCIPLES

Which values & principles are important for us while utilizing AI?



## END-USER COMMUNICATION

How do we keep our customers informed & enable explainability?



## ROLES & RESPONSIBILITIES

Who has the responsibility over governing & overseeing our AI?



## GOVERNANCE & RISK PROCESS

How do we make decisions and evaluate risks related to our AI?



## OPERATIONS & TRANSPARENCY

How do we manage the quality & ensure the transparency of our operations?



## AI Ethics and Governance Lead

### Massachusetts Mutual Life Insurance Company Company Location Boston, MA, US

#### Description

At MassMutual, we're passionate about helping millions of people find financial freedom and this passion has driven our approach to developing meaningful experiences for our customers. The Data Science Team, part of Enterprise Technology and Experience, is comprised of highly skilled, collaborative, problem solvers who are motivated to create innovative solutions that exceed the changing needs of our customers and move MassMutual – and the industry – forward.

To continue our cutting-edge work, we are hiring an **Artificial Intelligence(AI)-Ethics and Governance Lead** to join our team.

#### What Great Looks Like In This Role

Our ideal candidate has extensive knowledge of methods in machine learning and Artificial Intelligence, and ideally has practitioner experience. Data, analytics and algorithmic decision making are at the core of MassMutual's digital evolution. In this role you will be responsible for implementing an enterprise program that holistically addresses algorithm governance and enables the delivery of superior customer experiences, trust and loyalty. This leader will be responsible for working with data scientists and other leaders across the organization on policy and implementing processes and systems that inventory, assess, organize, measure, and track the firm's algorithmic assets and models.

#### **Objectives of the role**

- Deliver a principles-driven, adaptive policy framework to inventory, assess, organize, measure, and track MassMutual's AI assets across the enterprise.
- Champion and facilitate adoption of the framework to enable confident innovation with machine learning and algorithmic decision making across all business channels.
- Establish and maintain the program and be responsible for identifying and following trends in the broader global marketplace.

#### **Daily And Monthly Responsibilities**

- Collaborate and partner with other leaders across our data science team, business channels, law, compliance and enterprise risk, and information security for best practices and execution.
- Develop and implement algorithm standards and standards of use.
- Establish quantitative measures of policy compliance including algorithm measures that include performance, fairness, accountability, transparency, and auditability.
- Collaborate with various departments to establish automated processes that collect and compute measures of progress.
- Continuously improve and advocate enterprise data, algorithm and AI governance policies.
- Maintain a strategic roadmap for AI governance roll-out across the enterprise.
- Create and maintain a meta-data asset that accurately characterizes the firm's algorithms through time, as well as their adherence to governance policies.
- Identify and engage AI leaders across the enterprise and coordinate with them to achieve adoption and consistency of governance across business channels.
- Stay up-to-date and informed on emerging practices for improving algorithm and AI governance practices.

## Responsible AI Program Director

### Capital One Company Location Vienna, VA, US

#### **Responsible AI Program Director**

As the Responsible AI Program Director, you will play a leading role in shaping how Capital One ensures our computational decisions are aligned to our values. Working closely with stakeholders across the company, you will operationalize Responsible AI through products, policies, and practices. This may involve evolving current techniques or creating entirely new ways of doing things. You will play a critical role in the strategic direction. You will help drive the Responsible AI vision and roadmap through collaboration and expertise. This is a role where your strong technical background will shine — whether you come from technical product management, data science, or related fields.

**If you are passionate about ethical tech, have a concrete understanding of ML/data science, are entrepreneurial, and demand excellence, please join us to pioneer how Responsible AI is implemented in the real world at scale.**

#### **To Be Successful In This Role, You Must**

- be excited about developing a team and working with partners to prioritize tasks to begin executing quickly
- be collaborative by nature and comfortable influencing across organizational and functional boundaries
- comfortable tackling complex challenges across areas such as policy, compliance, and governance.

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# Explainable AI for everyone


 Design system

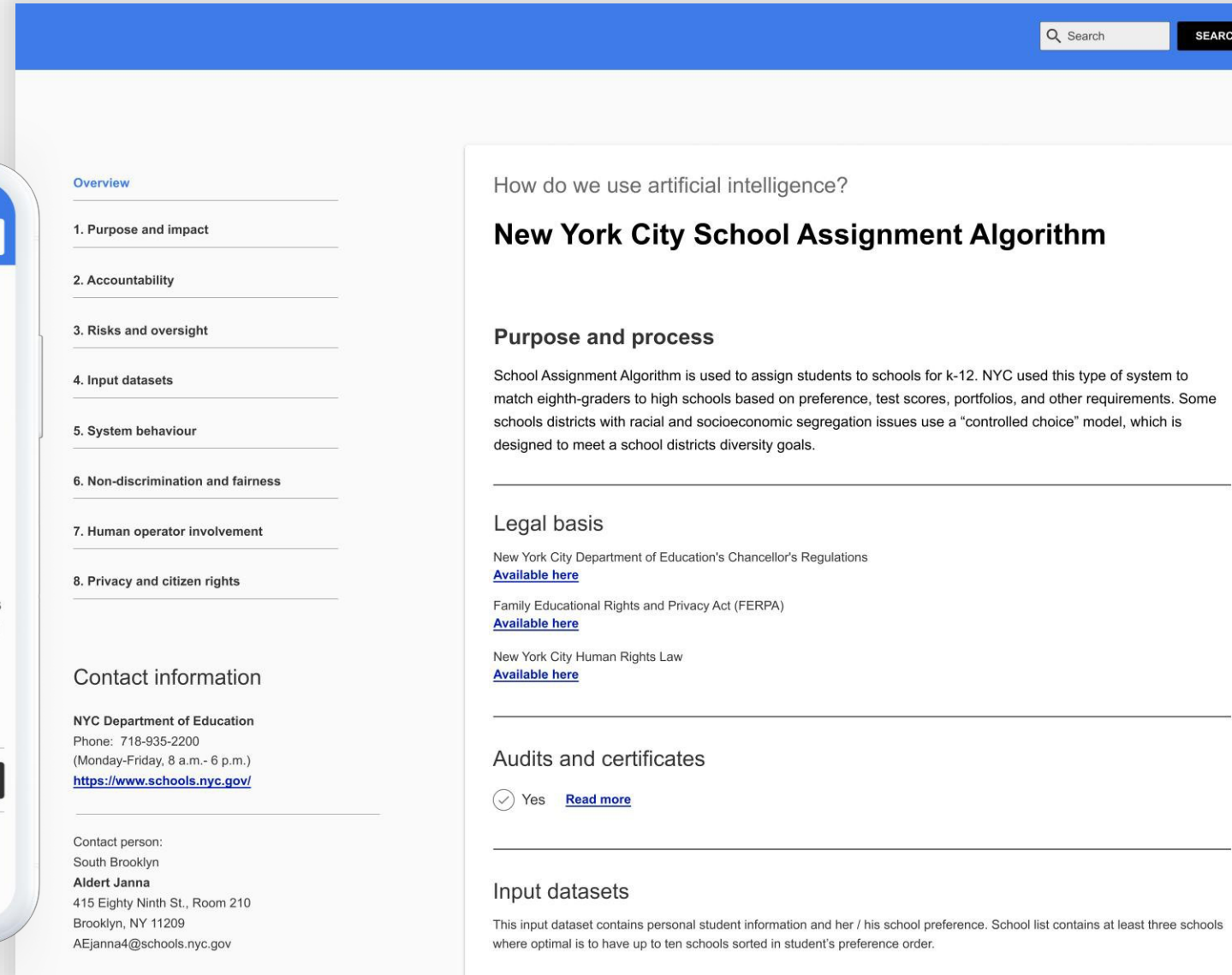
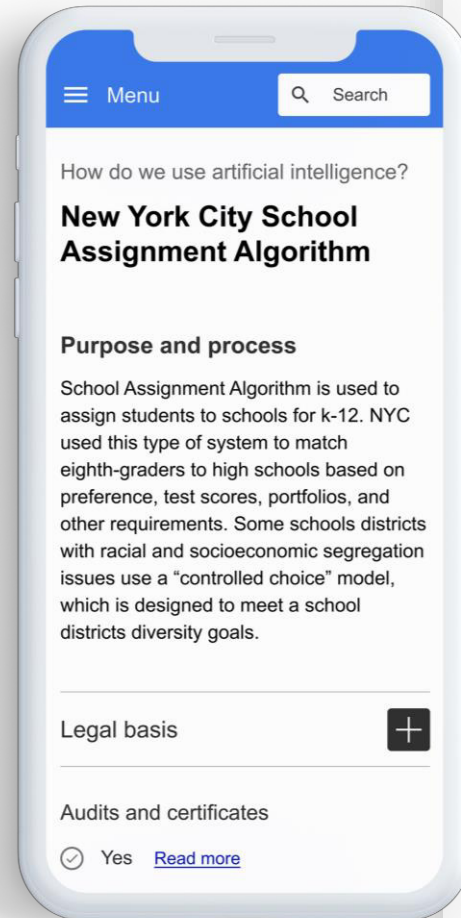
 Register

 Transparency metadata

 Explainability as-a-service

 Third party audits

 Smart certifications



The image shows the desktop version of the 'New York City School Assignment Algorithm' page. The page has a blue header with a search bar. The main content is organized into sections: Overview, Purpose and process, Legal basis, and Audits and certificates. The 'Purpose and process' section includes a list of 8 items: 1. Purpose and impact, 2. Accountability, 3. Risks and oversight, 4. Input datasets, 5. System behaviour, 6. Non-discrimination and fairness, 7. Human operator involvement, and 8. Privacy and citizen rights. The 'Legal basis' section lists three regulations: New York City Department of Education's Chancellor's Regulations, Family Educational Rights and Privacy Act (FERPA), and New York City Human Rights Law. The 'Audits and certificates' section has a 'Yes' option with a 'Read more' link.

How do we use artificial intelligence?

## New York City School Assignment Algorithm

### Purpose and process

School Assignment Algorithm is used to assign students to schools for k-12. NYC used this type of system to match eighth-graders to high schools based on preference, test scores, portfolios, and other requirements. Some schools districts with racial and socioeconomic segregation issues use a "controlled choice" model, which is designed to meet a school districts diversity goals.

### Legal basis

New York City Department of Education's Chancellor's Regulations  
[Available here](#)

Family Educational Rights and Privacy Act (FERPA)  
[Available here](#)

New York City Human Rights Law  
[Available here](#)

### Audits and certificates

Yes [Read more](#)

### Input datasets

This input dataset contains personal student information and her / his school preference. School list contains at least three schools where optimal is to have up to ten schools sorted in student's preference order.

### Overview

1. Purpose and impact
2. Accountability
3. Risks and oversight
4. Input datasets
5. System behaviour
6. Non-discrimination and fairness
7. Human operator involvement
8. Privacy and citizen rights

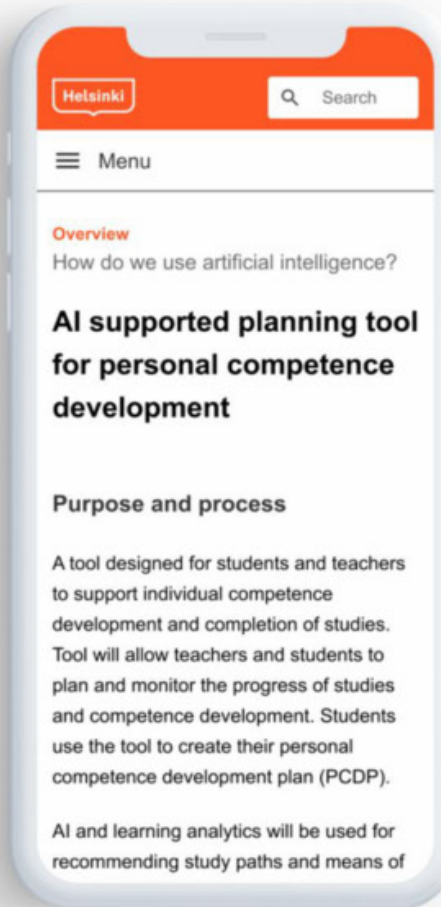
### Contact information

NYC Department of Education  
Phone: 718-935-2200  
(Monday-Friday, 8 a.m.- 6 p.m.)  
<https://www.schools.nyc.gov/>

Contact person:  
South Brooklyn  
**Aldert Janna**  
415 Eighty Ninth St., Room 210  
Brooklyn, NY 11209  
AEjanna4@schools.nyc.gov



# Shared model for citizen AI transparency



**Helsinki** Search from page SEARCH

**Overview**

How do we use artificial intelligence?

## AI supported planning tool for personal competence development

**Purpose and process**

A tool designed for students and teachers to support individual competence development and completion of studies. Tool will allow teachers and students to plan and monitor the progress of studies and competence development. Students use the tool to create their personal competence development plan (PCDP).

AI and learning analytics will be used for recommending study paths and means of studies to help students reach their learning targets and progress their studies. Analytics will enable individualized early interventions and targeted support by teachers to those who benefit from it the most.

Tool provides an enhanced view for teachers and other specialists for their pedagogical planning and guiding individual students in their studies. In addition, school administration benefits of its support for improved pedagogical planning, anticipation and strategic management.

**Input datasets**

Service utilizes data stored in the information systems governed by parties responsible for arranging education. Education administration data on competence development plans, information on education arrangements, completed studies and results of those will be utilized. Studying data used consists of education system event logs and information on tasks and evaluations performed by a student. In addition, with the explicit consent of a student, previous study history records and completed degrees stored in the national databases may be utilized.

**System output**

Service creates personalized recommendations and predictions for a vocational student. System provides recommendations of alternative study paths based on student competences, progress and competence development targets. System predicts the length of studies, the need for support and time of graduation based on competence development plan, progress and the combination of educational event log data.

**Administrative task**

Vocational Education and Training Act (351/2017)  
[Available here](#)

Basic Education Act (629/1998)  
[Available here](#)

Student Welfare Act (1287/2013)  
[Available here](#)

**Audits and certificates**

Yes [Read more](#)

Contains personal data

**Contact information**

Education division, City of Helsinki  
PL 51300, Töyryskatu 2 D  
00099 Helsinki  
City e-services portal:  
<https://asiointi.hel.fi/>

Contact person:  
Katri Alto  
Education division  
Email: [katri.alto@hel.fi](mailto:katri.alto@hel.fi)

Send this page to email

Email address

**SEND**

**Table of Contents:**

1. Purpose and impact
2. Accountability
3. Risks and oversight
4. Input datasets
5. System behaviour
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# Ethics certificates



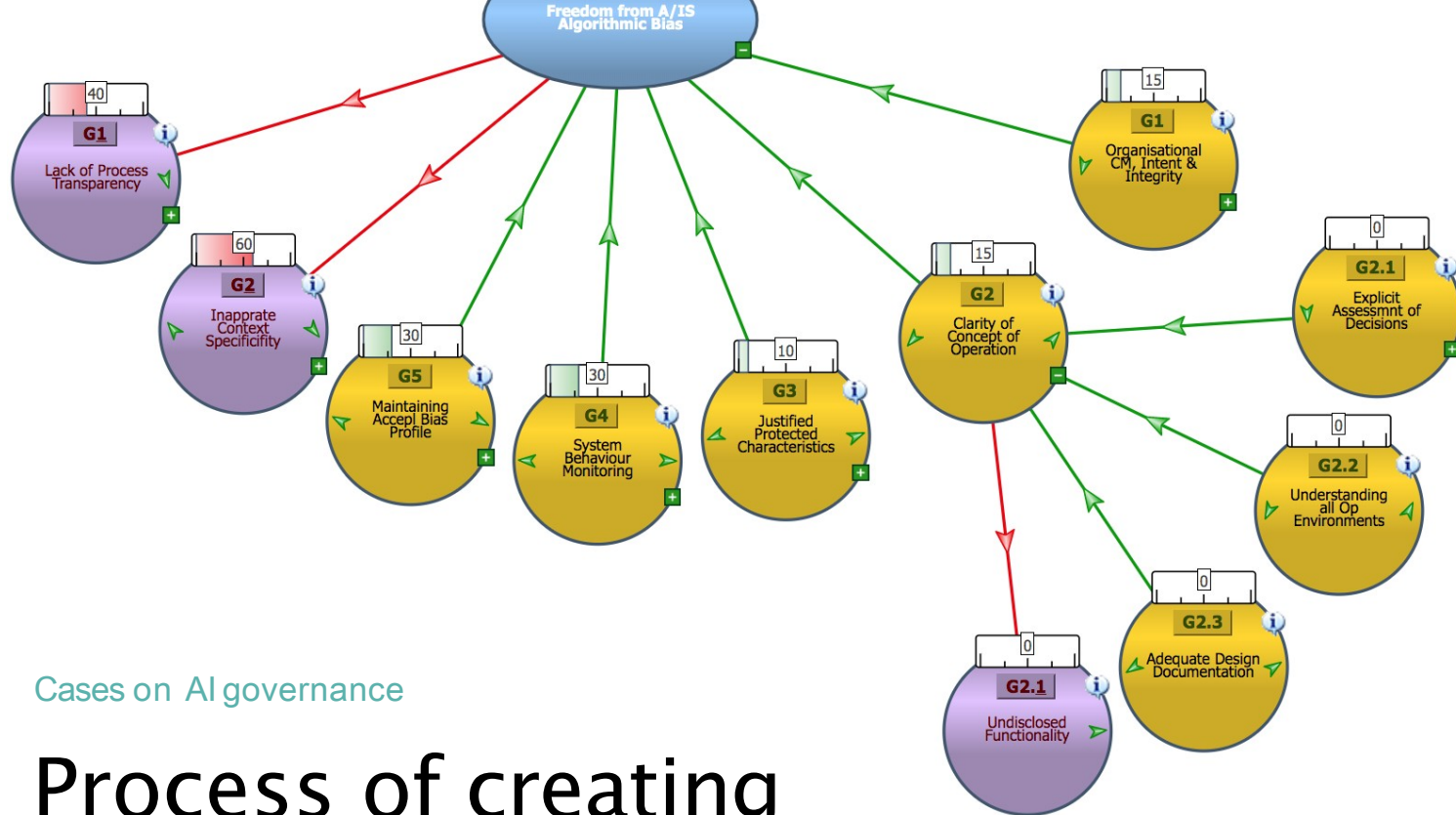
## The Ethics Certification Program for Autonomous and Intelligent Systems (ECPAIS)

Developing metrics and processes towards the implementation of a certification methodology addressing transparency, accountability and algorithmic bias

The Ethics Certification Program for Autonomous and Intelligent Systems (ECPAIS) has the goal to create specifications for certification and marking processes that advance **transparency, accountability, and reduction in algorithmic bias** in autonomous and intelligent systems. ECPAIS intends to offer a process and define a series of marks by which organizations can seek certifications for their processes around the A/IS products, systems, and services they provide.

**For more information:**

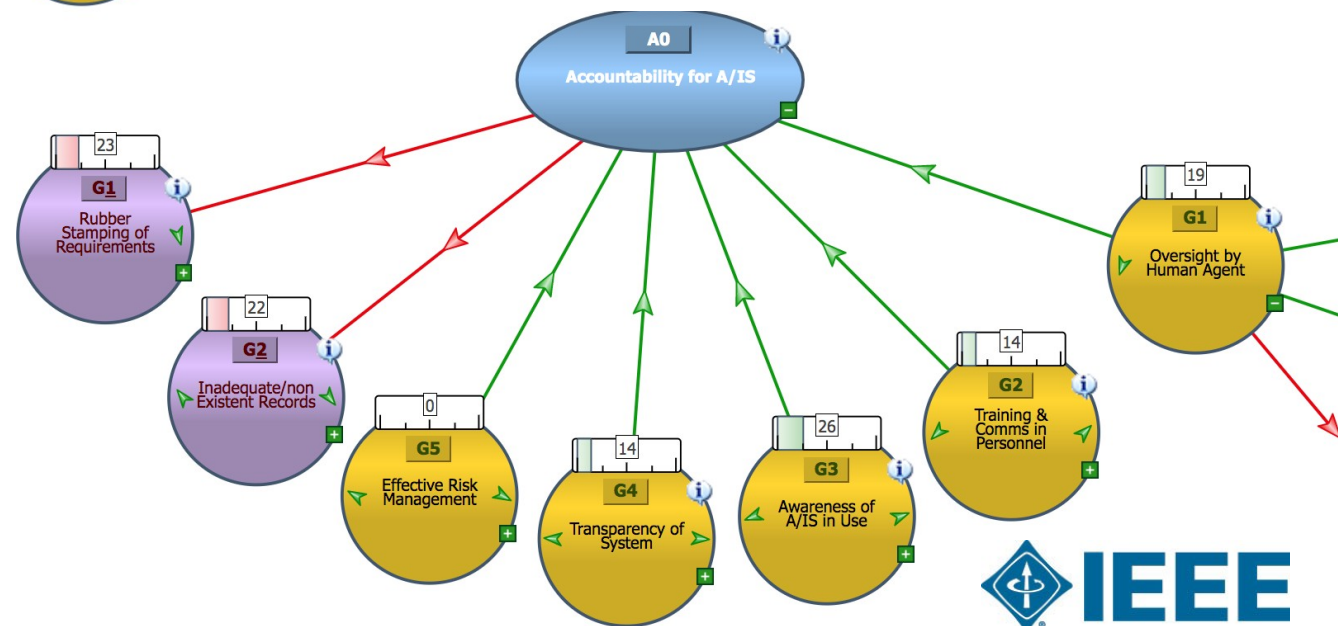
[standards.ieee.org/industry-connections/ecpais.html](https://standards.ieee.org/industry-connections/ecpais.html)



Cases on AI governance

# Process of creating AI ethics certificates

- Expert competence criteria and invitations
- Adopted specific reference models
- Developing ethical foundational requirements
- Forms and composition of evidence for conformity
- Use case trials and refinement
- Evaluation scale & units and desired attainment benchmarks



## Takeaways

AI has matured and is highly **influential** across industries.

Concerns over the realization of **core values & fundamental rights** in digital create totally new risks for companies.

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Ethical AI is **lawful, value-based, robust** and **risk-aware**. It considers ethics over the whole lifecycle.

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AI policy & governance lead is a **critical job role** for every AI company in Financial Services.

Thank you. Kiitos.

CEO & Co-Founder

Meeri Haataja

[meeri@saidot.ai](mailto:meeri@saidot.ai)

@meerihaataja

+358 (40) 7725010



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