Algorithm Audit

CEN CENELEC

Fundamental Rights Impact Assessments and stakeholder panels

Towards inclusive, deliberative and transparent decision-making procedures when producing and deploying AI systems

February 2024

Overview

1 Fundamental Rights Impact Assessment (FRIA)

2 Stakeholder panel

3 Connection with legal provisions in the AI Act

4 Relevant JTC21/SC42 and ISO activities

Activities NGO Algorithm Audit

Normative advice commissions	Advising on ethical issues emerging in concrete algorithmic practices through deliberation, resulting in *algoprudence* (jurisprudence for AI)
Technical tooling	Implementing and testing technical tools to detect and mitigate bias in data and algorithms, see bias detection tool, synthetic data generation
Knowledge platform	Bringing together knowledge and expertise to ignite the collective learning process for responsible algorithms, e.g., AI Policy Observatory and AI Act standards

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European Artificial Intelligence & Society Fund

Ministerie van Binnenlandse Zaken en Koninkrijksrelaties

1. **Fundamental Rights Impact Assessment**
2. Stakeholder panels
3. Connection with legal provisions in the AI Act
4. Relevant JTC21/SC42 and ISO activities

Evaluation process to analyse how AI may impact individuals' fundamental rights

Fundamental rights EU Charter (selection)

Rights, freedoms and principles

Art. 1 – Human dignity

Art. 8 – Protection of personal data

Art. 11 – Freedom of expression and information

Art. 16 – Freedom to conduct a business

Art. 17 – Right to property

Art. 21 – Non-discrimination

Art. 41 – Right to good administration

Note: not two fundamental rights are mutually compatible. Value tensions always exists

Characteristics of a FRIA

> Goal:
>   > Identifying the normative dimension of data modelling
>   > Fostering dialogue how decisions regarding the normative dimensions of AI systems are made

> *Ex ante* rather than *ex post* risk evaluation mechanism

> Stimulating self-reflection. Not providing answers or concrete guidelines how to resolve these tensions

> Relies on decentralized capacity to resolve fundamental rights tensions

Normative here means questions for which no objective truth exist

big challenge!

Many FRIAs for AI systems have been developed, but shared lessons are not learnt yet

#	Name	Organization	pages
1	Fundamental Rights and Algorithm Impact Assessment (FRAIA)	Dutch Ministry of Internal Affairs, in collaboration with Utrecht University	99
2	Huderia	Alan Turing Institute	327
3	Algorithmic impact assessment: user guide	Ada Lovelace Institute	30
4	Assembling accountability: algorithmic impact assessment for the public interest	Data & Society	61
5	Fundamental Rights Impact Assessments (FRIA)	For Humanity	web page
6	Automated Decision-Making Systems in the Public Sector	Algorithm Watch	48
7	AFRIA	Aligner	Excel
8	Ethical impact assessment: a tool of the Recommendation on the Ethics of Artificial Intelligence	UNESCO	51
9	An assessment framework for non-discriminatory AI	DemosHelsinki	17
10	Algorithmic Impact Assessment tool	Government of Canada	web page

18 conducted FRAIA at Dutch PSOs will be made publicly available in spring '24

Stakeholder engagement process

Dutch example: higher-dimensional proxy-discrimination in the context of risk profiling

ML-based variable selection method for risk profiling

Variable
Age
Gender
ZIP code
Income
Housing type: flatmates, living alone etc.
Literacy rate
Number of address changes in the last year
…
50+ more variables

🟨 risk on intersectional bias wrt. socio-economic status

Result from the FRAIA

1.3.2 *What are the public values that may suffer as a result of using an algorithm?*

Non-discrimination/equal treatment

2A.3.1 *What assumptions and biases are embedded in the data? How are their influences on the algorithm's output corrected or otherwise overcome or mitigated?*

Differentiation based on socio-economic status

4.1.1 *Is any fundamental right affected by the algorithm that is to be used?*

Yes

NOT ENOUGH

1. Fundamental Rights Impact Assessment

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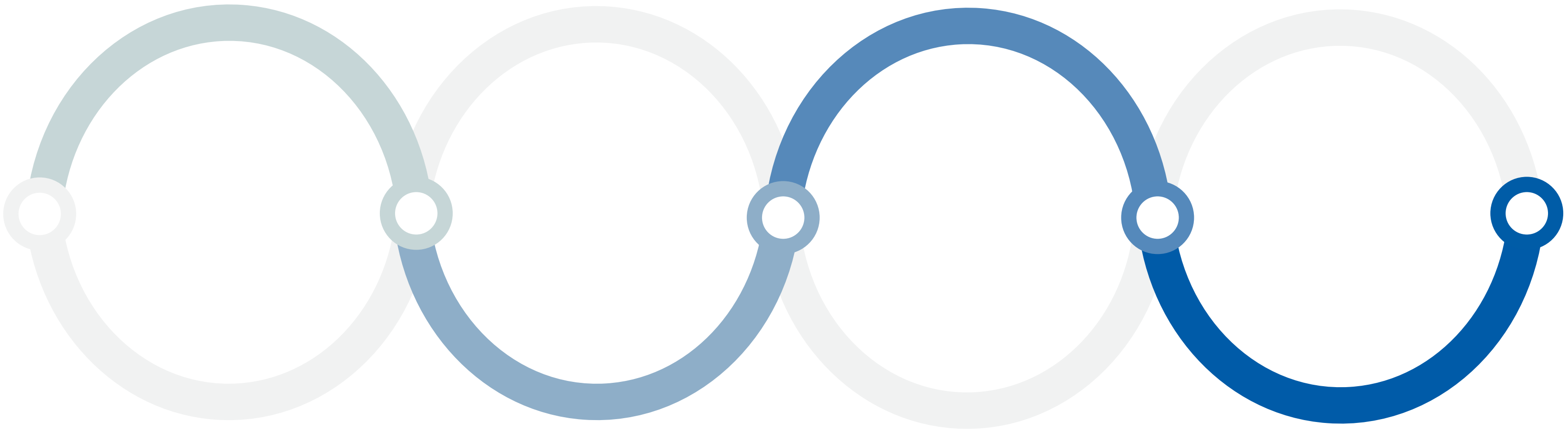
Evaluation process to resolve normative questions identified by a FRIA



Step 1

Identify issue

Identify a concrete ethical concern in a real algorithm or data-analysis tool

Step 2

Problem statement

Describe ethical issue, legal framework and hear stakeholders and affected groups

Step 3

Stakeholder panel

Deliberative conversation on ethical issue by diverse and inclusive stakeholder panel

Step 4

Public advice

Advice of panel is published together with problem statement, resulting in *algoprudence*

A diverse group of people having a deliberative conversation on ethical issues emerging in AI

Stakeholder panel

Maarten van Asten, Alderman Finance, Digitalisation and Event Municipality of Tilburg

Munish Ramlal, Ombudsperson of Metropole region Amsterdam

Abderrahman Al Aazani, Representative of the Ombusperson of Rotterdam

Francien Dechesne, Associate Professor Law and Digital Technologies, Universiteit Leiden

Oskar Gstrein, Assistant Professor Governance and Innovation, Rijksuniversiteit Groningen

1. Initial written feedback on identified issue

2. Panel gathering

diverse

inclusive

deliberative

transparent

accepted state-of-the-art

Dutch example: higher-dimensional proxy-discrimination in the context of risk profiling

Key take-aways of advice commission:

> Algorithmic profiling is possible under strict conditions

> Profiling must not equate suspicion

> Diversity in selection methods

> Well-considered use of profiling criteria

> Explainability requirements for machine learning

Ineligible criteria	
ZIP code, city district	⚡
Sex, gender	⛔
Reason for appointment with municipality (annual meeting, intake)	?
Type of contact (mail, phone, text, post)	⛓️‍💥
Literacy rate	⚡
ADHD	⛔
Mental health services	⛔
Number of children	⛓️‍💥
Sectoral (work) experience (hospitality, construction, logistics)	✥
Assertiveness	🔗 ▦
Professional appearance	▦

Eligible criteria	
Age	☸
No show at appointment with municipality	🔗 ☸
Reminders for provinding information	🔗 ☸
Participation in trajectory to work (training, workplace, social duty)	🔗 ☸ ?
Type of living (cohabitation, living together)	🔗 ☸
Cost sharing	🔗 ☸

Legenda

⛔	Legally forbidden	▦	Subjective
🔗	Linkage with aim pursued	✥	Subject to change
⛓️‍💥	No linkage with aim pursued	☸	Manageable risks
?	Unclear variable	⚡	Proxy discrimination

Composition of stakeholder panels vary per case, but share common dividers

Overview of stakeholders (not exhaustive)

- Model owner
- People subjected to the algorithm
- Legal, statistical, ethical experts
- Representatives of affected groups
- Subject matter experts

There is no universally optimal method for incorporating people subjected to an algorithm in a normative advice commission. Experiment with various working formats is therefore encourages, among others:

> Include a person subjected to the algorithm as part of the normative advice commission;

> Include people subjected to the algorithm in defining the problem statement prior to the panel gathering;

> Include people subjected to the algorithm by hosting focus sessions in parallel to the panel gathering.

The above options are not mutually exclusive. Please reach out if you think other options should be taken into account.

See also stakeholder engagement process (SEP) template in Huderia of the Alan Turing Institute

Algorithm Audit

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Algorithm Audit advocates inclusion of FRIA + stakeholder panels in risk management standards

Key take-away for AI bias testing standards:

- Not part of standardization request, but will be a delegated requirement sooner or later
- Guidelines to be developed how processes for normative standards can be made inclusive, deliberative, and transparent
- Standardized way to resolve non-standardizable issues

Similar approach in other regulatory instruments:

- AI Act: EU office for foundation models, i.e., multi-stakeholder composition
- GDPR art. 39(5): When a Data Privacy Impact Assessment (DPIA) is mandatory, stakeholders should be heard
- GDPR: *accepted state-of-the-art* to provide time-invariant legal requirements. Same will apply to AI Act (art. 8)

FRIA

Ministry of the Interior and Kingdom Relations

March 2022

Impact Assessment
Fundamental rights and algorithms

Which of the existing 10?

+

stakeholder panel

Overview of AI Act articles relating to bias and fundamental rights

Art. 4 – Amendments to Annex I

‘diversity, non-discrimination and fairness’ means that AI systems shall be developed and used in a way that includes diverse actors and promotes equal access, gender equality and cultural diversity, while avoiding discriminatory impacts and unfair biases that are prohibited by Union or national law;

Art. 9 – Risk management system

- Assess whether risk management system is in place
- Document and maintain risk management obligations for algorithm documentation, monitoring and evaluation

Art. 10 – Data and data governance

- Assess existing data collection, data processing and data quality checks
- If these exist, assess documentation of relevant design choices and assumptions, including bias detection and mitigation measures

Recital 18

Technical inaccuracies of AI systems intended for the remote biometric identification of natural persons can lead to biased results and entail discriminatory effects. This is particularly relevant when it comes to age, ethnicity, sex or disabilities.

Art. 69 – Codes of conduct

including where they are drawn up in order to demonstrate how AI systems respect the principles set out in Article 4a and can thereby be considered trustworthy

Art. 15 – Accuracy, robustness, cyber security

after being placed on the market or put into service shall be developed in such a way to ensure that possibly biased outputs due to outputs used as an input for future operations (‘feedback loops’) are duly addressed with appropriate mitigation measures.

Recital 44

Training, validation and testing data sets … with specific attention to the mitigation of possible biases in the datasets, that might lead to risks to fundamental rights or discriminatory outcomes for the persons affected by the high-risk AI system.

Art. 43 – Conformity assessment

- Comply to CE certification and available non-CE certifiable content
- Carry out examination, test and validation procedure before, during and after development of AI system
- Pre-market assessment and post-market monitoring

Art. 28 – **Obligations of the provider of a foundation model**

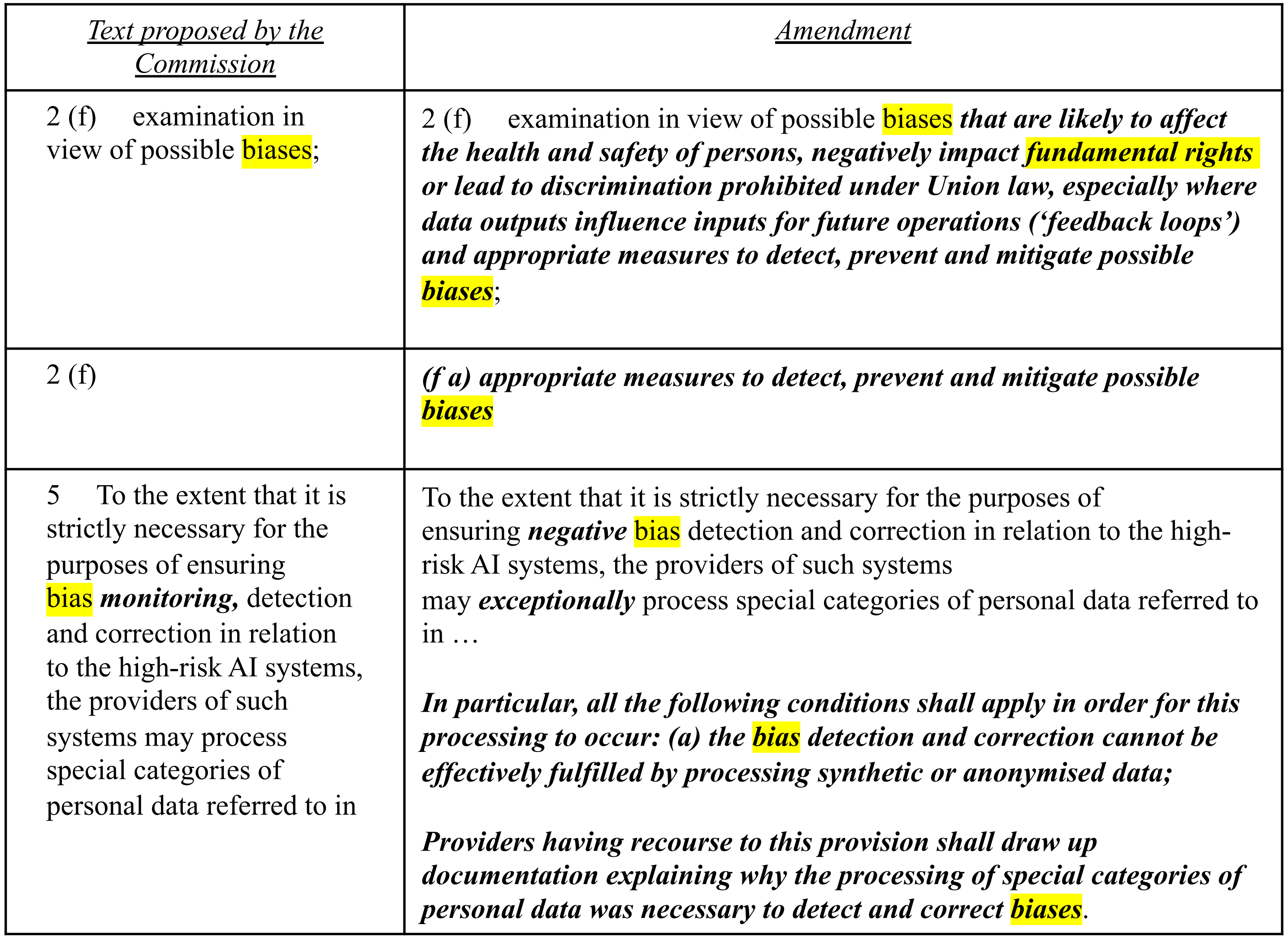
- Process and incorporate only datasets that are subject to appropriate data governance measures for foundation models, in particular measures to examine the suitability of the data sources and possible biases and appropriate mitigation

Example #1 on bias testing – Art. 10 Data and data governance

Art. 10 – Data and data governance

2. Application of appropriate techniques for data governance and data management
   - f. Examination in view of possible biases;

5. To the extent that it is strictly necessary for the purpose of ensuring bias monitoring, detection and correction in relation to the high-risk AI systems … appropriate safeguards for the fundamental rights of natural persons



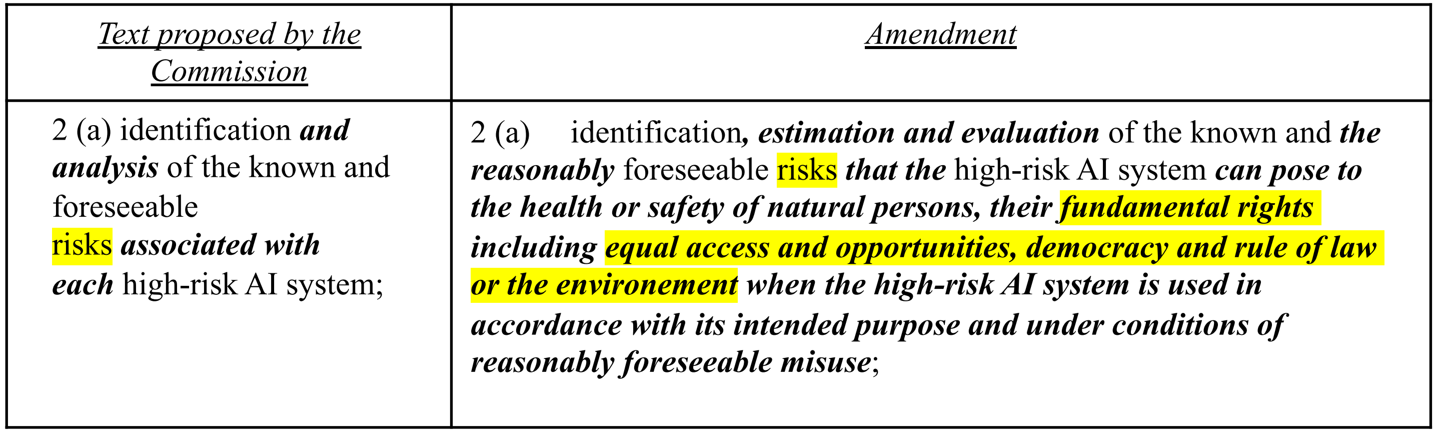
Text proposed by the Commission	*Amendment*
2 (f) examination in view of possible biases;	2 (f) examination in view of possible biases ***that are likely to affect the health and safety of persons, negatively impact fundamental rights or lead to discrimination prohibited under Union law, especially where data outputs influence inputs for future operations (‘feedback loops’) and appropriate measures to detect, prevent and mitigate possible biases***;
2 (f)	***(f a) appropriate measures to detect, prevent and mitigate possible biases***
5 To the extent that it is strictly necessary for the purposes of ensuring bias ***monitoring,*** detection and correction in relation to the high-risk AI systems, the providers of such systems may process special categories of personal data referred to in	To the extent that it is strictly necessary for the purposes of ensuring ***negative*** bias detection and correction in relation to the high-risk AI systems, the providers of such systems may ***exceptionally*** process special categories of personal data referred to in … ***In particular, all the following conditions shall apply in order for this processing to occur: (a) the bias detection and correction cannot be effectively fulfilled by processing synthetic or anonymised data;*** ***Providers having recourse to this provision shall draw up documentation explaining why the processing of special categories of personal data was necessary to detect and correct biases***.

Example #2 on risks of violating fundamental rights – Art. 9 Risk management system

Art. 9 – Risk management

1. A risk management system shall be established, implemented, documented and maintained in relation to high-risk AI systems.

a) identification ***and analysis*** of the known and foreseeable risks ***associated with each*** high-risk AI system;



Text proposed by the Commission	*Amendment*
2 (a) identification ***and analysis*** of the known and foreseeable risks ***associated with each*** high-risk AI system;	2 (a) identification***, estimation and evaluation*** of the known and ***the reasonably*** foreseeable risks ***that the*** high-risk AI system ***can pose to the health or safety of natural persons, their fundamental rights including equal access and opportunities, democracy and rule of law or the environement when the high-risk AI system is used in accordance with its intended purpose and under conditions of reasonably foreseeable misuse***;

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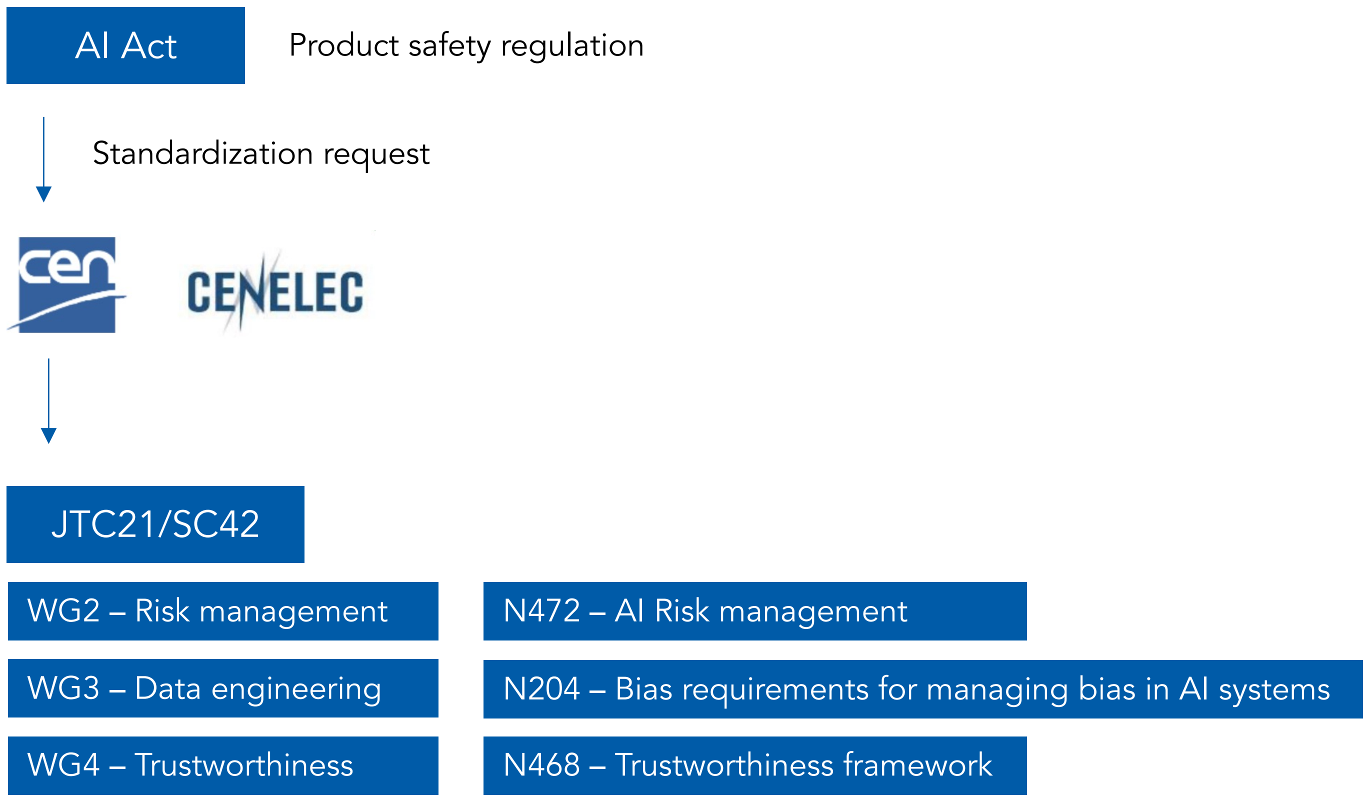
Overview of AI bias testing related standards

Europe



AI Act

Product safety regulation

Standardization request

cen CENELEC

JTC21/SC42

WG2 – Risk management

WG3 – Data engineering

WG4 – Trustworthiness

N472 – AI Risk management

N204 – Bias requirements for managing bias in AI systems

N468 – Trustworthiness framework

International

ISO IEC ITU

ISO/IEC 23894 AI bias terms

ISO/IEC 12791 Treatment of unwanted bias in classification and regression machine learning tasks

ISO/IEC 42001 AI System Management

ISO/IEC 42005 Impact assessment

International values

⚡

Vienna agreement

European values

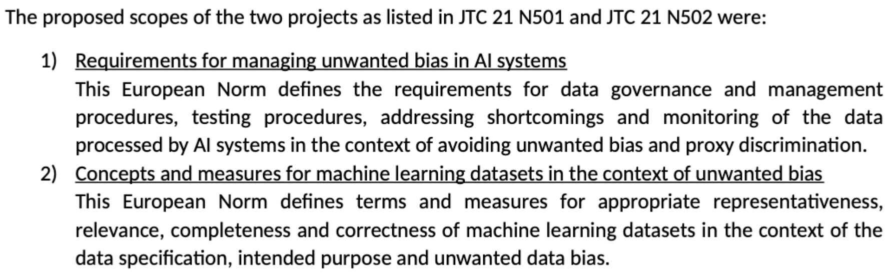
WG2 – Risk management system

Scope of NWIP encourages contributions regarding fundamental rights:

Risks covered include both risks to health and safety and risks to fundamental rights which can arise from AI systems, with impact for individuals, organisations, market and society. This document also defines methods that can be used to determine if a package of risk management measures associated with an AI system will be able to ensure that certain risks arising from that product or system are identified, monitored, and managed, leading to an acceptable level of risk.

WG3 – Stakeholder panels as part of AI bias testing procedure (engineering aspects)

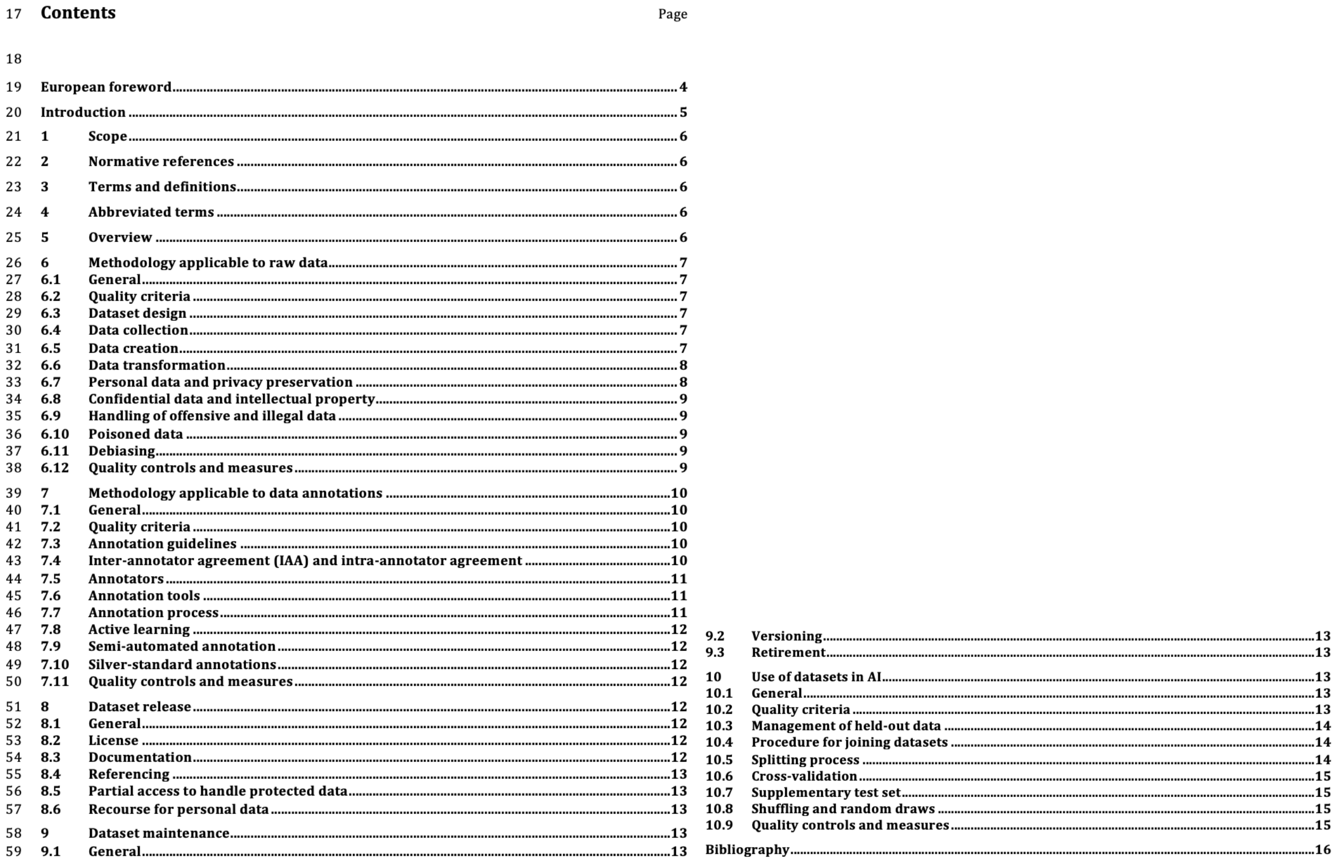
Scope preliminary work item (PWI) on bias standards



The proposed scopes of the two projects as listed in JTC 21 N501 and JTC 21 N502 were:

1) Requirements for managing unwanted bias in AI systems
   This European Norm defines the requirements for data governance and management procedures, testing procedures, addressing shortcomings and monitoring of the data processed by AI systems in the context of avoiding unwanted bias and proxy discrimination.
2) Concepts and measures for machine learning datasets in the context of unwanted bias
   This European Norm defines terms and measures for appropriate representativeness, relevance, completeness and correctness of machine learning datasets in the context of the data specification, intended purpose and unwanted data bias.

NWIP Data outline v0



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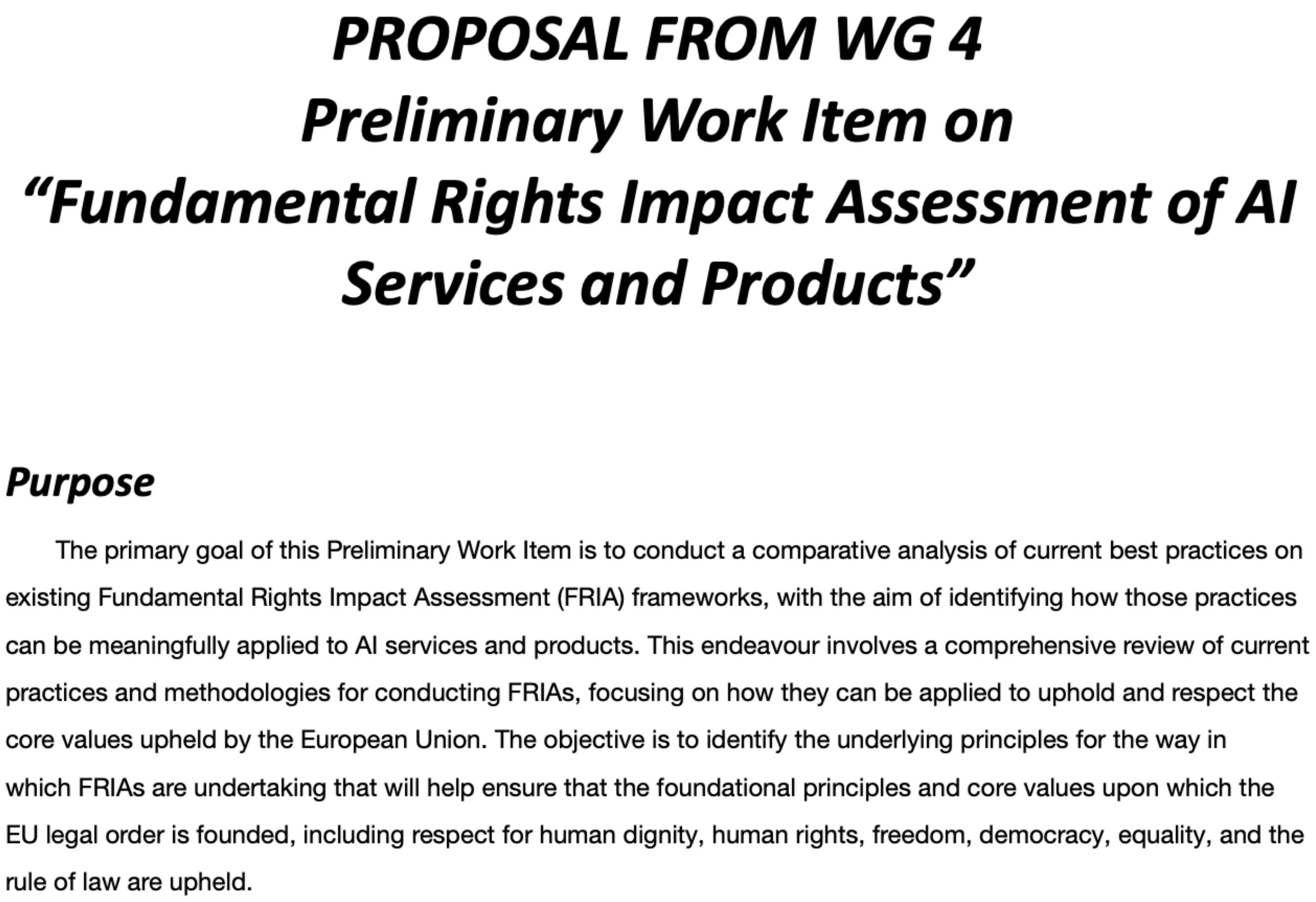
WG4 – PWI on FRIA



PROPOSAL FROM WG 4
Preliminary Work Item on
"Fundamental Rights Impact Assessment of AI Services and Products"

Purpose

The primary goal of this Preliminary Work Item is to conduct a comparative analysis of current best practices on existing Fundamental Rights Impact Assessment (FRIA) frameworks, with the aim of identifying how those practices can be meaningfully applied to AI services and products. This endeavour involves a comprehensive review of current practices and methodologies for conducting FRIAs, focusing on how they can be applied to uphold and respect the core values upheld by the European Union. The objective is to identify the underlying principles for the way in which FRIAs are undertaking that will help ensure that the foundational principles and core values upon which the EU legal order is founded, including respect for human dignity, human rights, freedom, democracy, equality, and the rule of law are upheld.

Algorithm
Audit

Building public knowledge for ethical algorithms

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