Understanding & auditing algorithms

30 November 2021

Netherlands
Court of Audit

Annual accountability audit

Three components:

Financial audit

Operational management

Policy results

Netherlands Court of Audit: algorithms

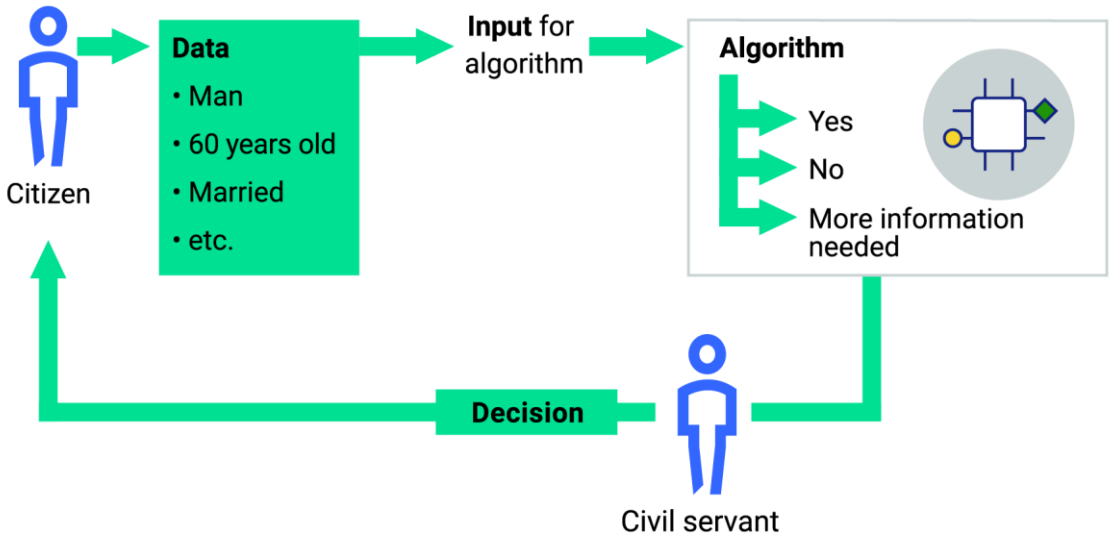
Understanding algorithms: demystification

- The use of algorithms was becoming a topic of public debate.
- Auditors had concerns about algorithms being ‘black boxes’.

Algorithms are not new in themselves. What is new is how they are used today

An algorithm is a set of rules and instructions that a computer follows in order to solve a problem or answer a question

Example: A person applies for benefits. Is he entitled to one?



Context for the audit: opportunities and threats

Opportunities

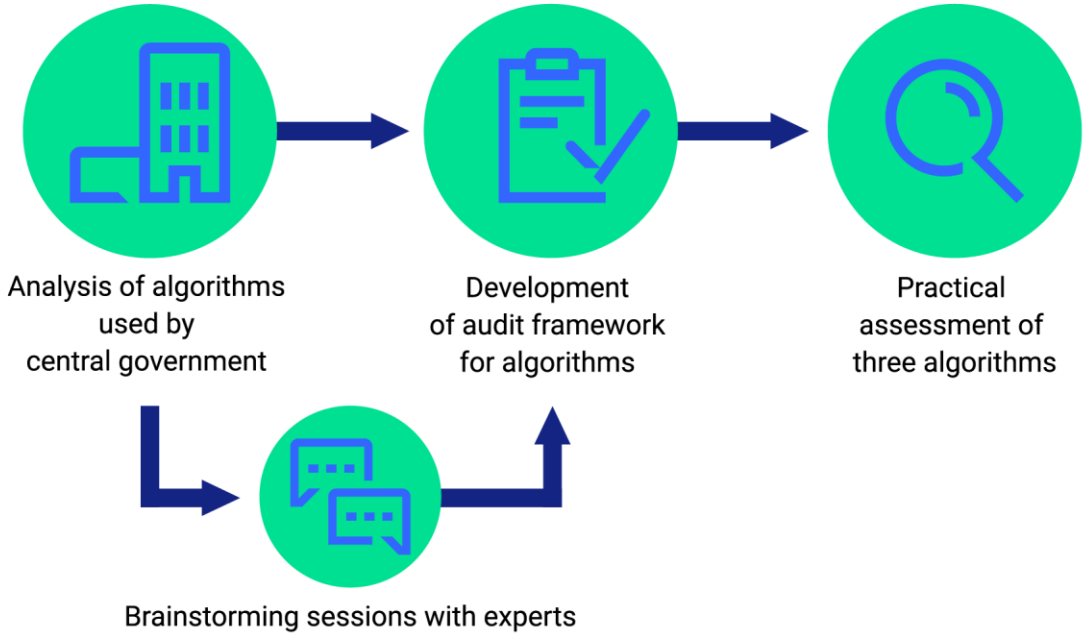
- Algorithms support and improve operational management and service processes
- Algorithms make decision-making processes more transparent

Threats

- Effect on government action not clear to citizens
- Algorithms and data (sets): biases, potentially undesirable effects
- Data and algorithms owned by external suppliers

Our audit approach

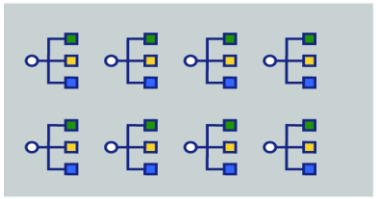
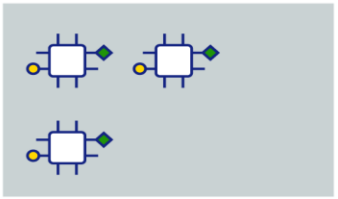
Our audit of algorithms consists of three components



Part 1: Assessment of algorithms used by central government

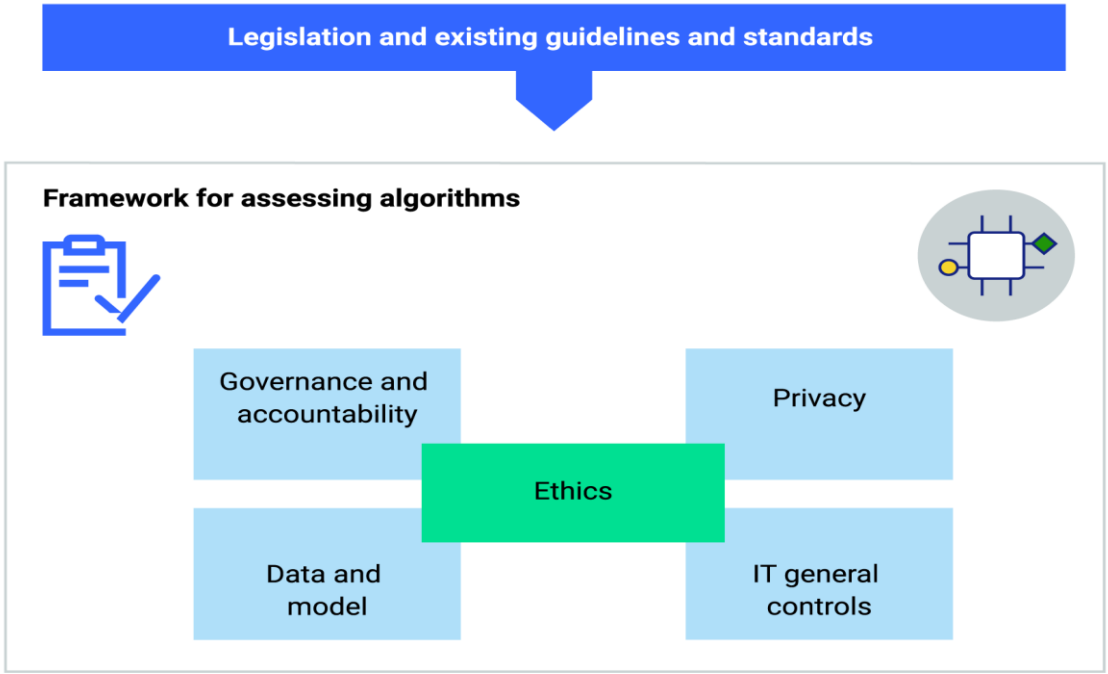
Central government uses mainly simple algorithms and hardly any sophisticated algorithms

Simple algorithms → **Sophisticated algorithms**

Decision trees	Statistical machine learning models	Neural networks
		
Example: Deciding on the amount and duration of a benefit payment	Detecting applications with a high risk of inaccuracies, in order to prompt extra checks	Detecting human trafficking by using facial recognition software to examine pictures on suspects' telephones

Part 2: The development of an audit framework for algorithms

Our audit framework is based on five perspectives



Conclusion: ‘an algorithm is not a *black box*’

- Full account is not taken of the interests of private citizens.
- Improvements are essential for the responsible use and further development of algorithms.
- We found examples of automatic decision-making in algorithms that perform simple administrative tasks.
- More complex algorithms do not take independent decisions. Government officials are involved.
- The absence of a centralised source of information means that there is a risk of algorithms adversely effecting government service delivery.

Recommendations

- Adopt a clear, uniform set of definitions and quality requirements for algorithms.
- Inform private citizens about the government’s use of algorithms.
- Document agreements on the use of algorithms, and set up continuous monitoring mechanisms.
- Produce information on the operation of IT general controls in relation to each algorithm.

Follow-up audit (launched in second half of 2021)

1. Use our audit framework to assess other algorithms used by government.

2. Algorithms in context.

Any questions?

https://english.rekenkamer.nl/publications/reports/2021/01/26/understanding-algorithms

https://english.rekenkamer.nl/binaries/rekenkamer-english/documents/publications/2021/01/26/audit-framework-for-algorithms/Audit+Framework+Algorithms.xlsx

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