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Research Report on Supervising governmental use of algorithms

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Index

Abstract

The Dutch government has been using algorithms for quite some time to perform tasks such as of automatic fines for speeding, steering of flood defences or predicting traffic jams. Algorithms are not new. However, it is new that in today's society attention is given to these algorithms. This seems to be explained by the renewed rise of Artificial Intelligence (AI).

Public administration practice is bound by legal rules. This does not change when algorithms are used. Yet in practice it is less obvious that the usual rules and accountability apply. At the beginning of this century, scientists advised that structural supervision be set up for the digital execution of laws by public administration. Due to recent reports about the governmental use of algorithms, the call for supervision is heard again.

This study focuses on current legal basis for supervision of governmental use of algorithms and how any supervision is currently being implemented in practice in The Netherlands. Mainly national administration agencies and its supervision is studied, but the same questions could be studied for provincial and local public administration. In the Netherlands several authorities are responsible for supervising public administration. This concerns the Court of Audit, the National Audit Service, the Netherlands Institute for Human Rights, the Dutch Data Protection Authority, the National Inspectorates and the National Ombudsman.

The study
After analysis of legislation and regulations it is concluded that there are no legal gaps in the legal competences of the supervisory authority. This is closely related to the fact that the use of algorithms is an instrument and therefor fully part of the execution of the governmental tasks. The supervisory authorities also have sufficient investigative powers to be able to do their work effectively.

Interviews show that structural research into the governmental use of algorithms is not yet implemented. However, the phenomenon has been included in their research agenda or in policy plans under titles such as "digitization" or "algorithms". The actual effort on this theme is still fairly superficial.

Partly for these reasons, it is therefore advised not to appoint a separate suervisor for the time being to supervise the governmental use of algorithms. Another important consideration here is that while algorithms and their use require special expertise, they must also be considered in the relevant context. The supervisory authorities supervise the performance of tasks and therefore also algorithms in that context. It is recommended to evaluate in two years' time how the monitoring of algorithms has evolved of.

Policy advice
In addition, the following policy advice can be formulated based on the results of the study. Getting a grip on the governmental use of algorithms requires a multi-disciplinary approach that guarantees the democratic and public legitimacy of algorithms. Part of this should be the way in which the executive power uses algorithms (1), the relationship between the executive power and the supervision (2) and the scientific developments (3).

Democratic legitimacy

- o Legislative process: the transformation of laws in computer programs so that they can be executed automatically is now concealed from the view of the House of Representatives or the City Council. This can be improved by trying out the Lokin model in which legislative texts are written in a very structured and precise manner to make the programming more easy. The discretion on how to interpret the law, will then (again) be part of the democratic checks and balances (Lokin 2018).[1]

  This is as well interesting for consultation purposes. In The Netherlands there is a public internet consultation on some proposals, and legislator is obliged to requests advice from the Council of State and the Dutch Data Protection Authority. The members of the House of Representatives or the City Council could also shift their attention and, in their role as co-legislators, ask for an explanation of the automated elaboration of a proposal for a law or regulation.

- o Standards framework: esthablish general standards, to which the governmental use of algorithms must at least comply and which are manageable not only for lawyers and policy staff, but also for data specialists. These general standards serve as a testing framework that guide the development and application of algorithms.

Executive Power

- o Duty of care: introduce a legal and explicit duty of care for public administration using algorithms. Every public agency must then ensure that the use of algorithms is efficient, lawful, fair, accurate and explainable. It is up to the public administration that decides to design or buy algorithms and use them, to comply with this duty of care and demonstrate this.

- o Algorithm impact assessment: let public agencies that want to use algorithms perform an impact assessment *before* it is decided to use them. This tool will help public administration to identify risks, mitigate them and check whether risks remain high. Arrange for authorities that have identified high risks but wish to use the algorithms to request the designated supervisor for a "prior consultation". If an impact assessment algorithm is part of the development of legislation, it can be submitted to the legislator and legislative advisors with the proposed act.

- o The human dimension: in many cases the use of algorithms of the government will impact humans. In those cases in it necessary to create more awareness in public administration that the application of a policy or algorithm gives an obligation to check whether the result is in accordance with the principles of good governance. Organize human intervention in such processes in combination with room to deviate.

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[1] * Not in original report: Comparable initiatives are already implemented in Denmark: Digital Ready Legislation. See https://en.digst.dk/policy-and-strategy/digital-ready-legislation/

- o Periodic audits: have public agencies periodically audited by an external party on:
  - o the design and operation of the algorithms,
  - o whether they still serve the purpose for which they were used,
  - o whether the human dimension is taken into account, and
  - o whether the control system is still functioning.

Relationship executive powers and supervision

- o Room for experiments: explore possibilities (possibly ensured by legislation) to allow experiments in the field of the use of algorithms. This enables both public administration practice and supervisory authorities to learn from each other.

Public legitimacy

- o Public debate: as the government, take the initiative to conduct the public debate about the digitization of society and the use of algorithms. For informal supervision it is important that journalism or interest groups are also involved and facilitated when questions raise. Transparency in action, not just in words, is a first requirement.

Science

- o Use knowledge from scientists: as in Germany, put together a committee from a variety of scientists and experts to arrive at jointly supported positions. This strengthens knowledge about and control over the use of algorithms. It would promote the effectiveness and usefulness of these points of view if real issues were answered in an interdisciplinary manner. This is necessary to bring various worlds together and to learn from each other. It is recommended that the first question for this committee would be to create a joint vocabulary such as an answer to questions as: what do we mean by bias, auditability and transparency?

Research report Supervision of governmental use of algorithms

1.   Introduction

The Ministry of Interior has asked Hooghiemstra & Partners to study the supervision of the use of algorithms by the government. This report is of importance as since the investigation motions suggested by members of The House of Representatives.[2]

The study was completed within the time frame of September 30 th until November 25 2019 and conducted by Valerie Frissen, Marlies van Eck en Thijs Drouen.

The following three main research questions are to be addressed:

1. *What is currently the legal basis for supervision?*
2. *To what extent is supervision of the governmental use of algorithms currently being implemented?*
3. *What policy advice can be given based on the results of the research?*

The Ministry of interior has also subsequently suggested some research questions. Whilst, the questions above are answered below, the strategy behind this research is discussed in section 2. The third section will seek to address the questions from a legal and scientific point of view. In section 4 the answers to the first two research question will be given. Lastly, in section 5 the police advice is discussed.

2   Research Strategy

To conduct this study and research the choice is made to perform a desk research, to interview professionals and to have a session with a sounding group.

The interviews compromised of set questions that helped further understand the supervision of the use of algorithms by the government. The interviews were semi-structured. In order to retrieve information and knowledge from the field, four types of interviews were conducted.
1. Interviews with representatives of supervisory authorities in public administration.
2. Interviews with representatives of supervisory authorities on companies.
3. Interviews with scientists.
4. Interview at municipality city of Amsterdam on its initiative 'Fair computers in town' (Eerlijke computers in de stad) (in House of Representatives: kamervragen en antwoorden 2019z05744 6 juni 2019, het bericht Amsterdam wil eerlijke computers in de stad.)

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[2] motion Verhoeven - Van der Molen, May 29 2019, Kamerstukken II, 2018/19, 26643, nr. 610 and Initiatiefnota Middendorp, Kamerstukken II, 2018/19, 35212, nr. 2 / motion Middendorp en Drost, June 20 2019, Kamerstukken II, 2018/19 35200 VII, nr. 14.

At the request of the Ministry of Interior, a group of representatives of several agencies was formed and used to validate some interim results in a two-hour group session.

Considering the limited time frame, the research focuses mainly on the use of algorithms in national / federal public administration. Needless to say that public administration, and there for the use of algorithms is much broader.

3.   Supervision of algorithms

The call for the supervision of algorithms used by the government is not new. Neither is their use of algorithms. Public administration has been using algorithms for decades, to better help perform its tasks Algorithms are used in decision support systems that assist in deciding when to close water defenses (storm surge barriers) like the Maeslant barrier. Algorithms are as well used to in automated decision making in individual cases such as the granting of housing allowance for example.

In the day to day execution of legislation civil servants make decisions with a certain amount of freedom in deciding and judging. They have a legitimate space to make their own decisions and exercise their own judgement about how public services are delivered. (Evans and Hupe 2019, 4). This is called the discretion. If the government uses algorithms to perform the tasks, this space (the decision-making practice) is filled in by algorithms.

Just like in the analog world, this type of execution falls under the various legal rules that apply to the public administration.

Examples of these rules are the General Administrative Law Act (Awb) (1994), the General Data Protection Regulation (GDPR), Dutch Freedom of Information Act and the various laws that are executed. Nevertheless, it is observed that when technology is deployed, it is in practice less obvious that the usual rules and accountability apply. The use of technology leads to loss of discretion in making individual decisions and poses scientists for questions how IT is organized in the democratic constitutional state (Zouridis, Van Eck & Bovens 2019).

This was already noted in The Netherlands in 2000 (Zouridis) and 2003 (Bovens). When researching the rise of automated decision making in public administration, they saw that the systems made repetitive inidvidual decisions for many citizens but without the normal constitutional checks and balances. It made them advise to establish a review body such as the National Ombudsman (Zouridis 2000: 317) and / or to implement institutional facilities Bovens 2003: 86). More then work instructions or official public policies, these systems determine the way public administration functions. These systems are called 'quasi-legislation' for a reason (Schartum 2016).

It is not just about the change in discretion and decision-making in public administration itself. It is precisely with these new ways of execution of legislation that many tasks are actually performed by private companies with public private partnerships being common.

In developing this technology, public administration is or will be dependent to a certain extent on the expertise of private companies. As observed in a research on the Dutch Police, public administration becomes more hybrid. Researchers warned of the increasing pressure on the rule of law: Who does what at what time for whom and who is responsible and accountable for it afterwards? (Meershoek & Hoogenboom 2013).

Research has shown that when public administration uses automated decision making systems, it cannot be determined whether these are in accordance with the law they execute (Van Eck 2018).

When it comes to algorithms making predictions, Leenes explains that it is conceivable that public administration should first be asked to explain the use of algorithms and to be accountable for the choice to use. He also suggested that if transparency is not achievable due to internal issues (i.e. not wanting to show how people are trying to detect fraud) then supervision by an independent authority (by audits) is desirable (Leenes 2016: 42).

The Netherlands Scientific Council for Public Policy (WRR) has advised that the algorithms and methods for data analyses in the security domain should be sound, meet the scientific criteria for good (statistical) research and be accessible for supervision (WRR Big data in een veilige en vrije samenleving 2016: 139). Lokin developed a method to better connect legislation and automated / digital execution (Lokin 2018).

In an expert session in The House of Representatives, the Rathenau Institute explicitly drew attention to the lack of democratic control of the digital government. It therefore recommended investing in stronger position for supervisory authorities (Rathenau Instituut 2019: 5).

During this study the government sent the Strategic Action Plan AI to the House of Representatives (Kamerstukken II, 2019/20 26643, no. 640), accompanied by a letter about AI, public values and human rights and a letter on safeguarding risks against data analysis by the government (Kamerstukken II, 2019/20, no. 641 and 642). In these documents, a first consideration has been given about supervising the use of algorithms. Reference is also made to this study.

3.1   Definitions

In this study, we discuss phenomena that are covered by different scientific disciplines, like administrative law, public administration science and artificial intelligence. At the same time the use of algorithms is more and more covered in media and in politics. This makes it very important to first define the objects of the research. After all, the word 'algorithm' is not immediately clear or distinctive.

To put it simply, an algorithm is a recipe for solving a problem step by step. It has been around for a long time (Volkskrant 3 August 2010). One of the oldest and best-known algorithms in history is the Euclidian algorithm (around 300 BC) (Wolswinkel 2019: 781). The algorithms' name giver, Al-Chwarizmi lived around 800 AD, algorithms have therefore existed long before the computer arrived.

It is said that a computer cannot be used without algorithms, but an algorithm can be applied without a computer (Wolswinkel 2019: 780).

Nowadays the word 'algorithm' is mainly used in relation to automation, automated processes (like automated decision making), big data and artificial intelligence (AI). The initiatives of the members of the House of Representatives that led to this study focus on algorithms that are automatically executed and used in automated decisions making or other automated processes (Kamerstukken II 2018/19, 26643, no. 610 and Kamerstukken II, 2018/19 35200 VII,nr.14).

In order to better understand this study, it is important to provide a clear definition of the concept of algorithm. Therefor the definition given by the Netherlands Scientific Council for Public Policy is used (WRR 2016: 21). It resembles the explanation used by the French Data Protection Supervisor (CNIL)[3] and Coormen' on a computer algorithm, namely "a set of steps to accomplish a task that is described precisely enough that a computer can run it" (Coormen 2013).

Algorithm: 'Automated sequence of steps for producing results (output) from initial data (input). An algorithm weighs the different data in relation to each other.'

There are two types to be dinstinguished:
- o *Algorithms programmed by humans in order to execute tasks automatically, like making decisions or execute these decisions. The IF [X] THEN [Y] algorithms. (Personal) Data are used as the variables. These type form the engine of ADM by the government.*
- o *Algorithms that can automatically adjust to previously achieved results and are used in analyzing and predicting. These are as well known as 'learning algorithms'. As in the other type of algorithms, the variables used for this are (personal) data. The result is a model that can be applied. These learning algorithms are often used to for probability calculation. For example, the chance that a child leaves school prematurely, the chance that a change of address has not been filed correctly or the chances on traffic jams.*

Secondly it is important to state that this research focuses solely on the supervision of the use of algorithms in public administration.

The following definition has been determined for this: governmental use of algorithms is the use of algorithms by public administration to perform its legal task.

Furthermore, it is important to be explicit on what is meant by supervision. For this purpose, the Framework visions for Supervision from 2001 and 2005 was used, in which the Cabinet of Ministers defines supervision as' collecting the information about whether an action or case meets the requirements set for it, and subsequently forming an opinion on it and 'possibly intervene as a result thereof '.

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[3] https://www.cnil.fr/fr/definition/algorithme

In 2001 and supplemented in 2005, the government cited the following principles as principles of this vision: supervision must be "independent, transparent, professional, selective, effective and cooperative" (Frissen and Ophoff 2019: 47). It is of importance to add that the supervisory authorities themselves need to be held accountable for the algorithms that they use.

The definition of supervision in this report is: *gathering information about whether an action or case meets the requirements set for it, subsequently forming an opinion on it and possibly intervening as a result thereof.*

Finally, this analysis also includes the public values that the Rathenau Institute has distinguished (Rathenau Institute 2017, Table 3.2, p.75). These public values are privacy, autonomy, security, control over technology, human dignity, justice and legal protection. The digitization of society can put these values under pressure more quickly. The various supervisory authorities supervise public administration on the basis of one or more of these public values.

A number of Dutch organizations are involved in this research as potential actors in the field of supervising the governmental use of algorithms. These are the Court of Audit, the National Audit Service, the Netherlands Institute for Human Rights, the Dutch Data Protection Authority, the National Inspectorates and the National Ombudsman. This is not an exhaustive list of the authorities involved.

4.   Inventory state of supervision of the governmental use of algorithms

4.1   What is currently the legal basis for supervision?

Introduction

This section solely focuses on answering the first research question: What is currently the legal basis for supervising the use of algorithms by the government?

As described in paragraph 3, public administration uses algorithms for some time as one of the instruments to perform its tasks. Most prominent example are the algorithms that are used in automated decision-making (discretion). In that respect, the use of algorithms is (just) another way how public administration organizes and fulfils its legal tasks.

This observation turns out to be essential for the way in which the interviewed supervisory authorities claim to include algorithms in their investigations.

In order to check if the algorithms are programmed, instructed and used according to the applicable laws and regulations, insight must be given in the ways in which the algorithm deals with the tasks and the impact it has.

The supervisory authorities list various factors that would play a role in any investigation:
- the type of algorithm used,
- the model used,
- which (input) variables influence the outcome of the model or which bias is still in it,
- which preventive control measures have been taken to, for example, prevent unauthorized access,
- which managerial, ethical and policy considerations have been made to use an algorithm,
- which choices were made prior to building the model,
- how the result of applying the algorithm is handled within an organization,
- how an organization ensures that a correlation is not the result of a sensitive variable outside the existing analysis model, which affects both the explanatory and the dependent variable, also referred to as "leakage",
- what the impact of the result is on the final decision-making and how it is dealt with,
- how does management assess whether the outcome is proportionate to the purpose of the algorithm / policy to be served,
- whether the rules on the use of the algorithms are also complied with in practice,
- how information is provided and
- at what stage is meaningful human contact provided.

Legal basis for supervision

In the Netherlands several authorities are responsible for supervising public administration.

Examples are the National Inspectorates that oversee a certain domain, for example the Justice and Security Inspectorate that supervises the justice domain and the Radiocommunications Agency that, among other things, supervises the telecommunications domain and the domain of digital resilience.

Some national inspectorates only focus on the national public administration, but usually supervision extends beyond the national public administration. In those cases public administration is monitored from a certain role. An example is the Inspectorate SZW that supervises the government as an employer.

Other supervisory authorities, such as Netherlands Institute for Human Rights and a supervisor, such as the Dutch Data Protection Authority, do not monitor a specific domain, but each supervise a fundamental right of citizens. This means that their activities go beyond the domain.

In order to investigate compliance with the rules, the supervisory authorities may use their legal competence as laid down in Title 5.2 of the Awb (GALA). The special legislation and regulations applicable to the specific domain determine the scope of supervision and, where necessary, include additional provisions that relate to investigative powers.

The powers of the Netherlands Institute for Human Rights follow from the Wet voor het College van de rechten van de mens, and the powers of the Dutch Data Protection Authority are based on the GDPR, the Uitvoeringswet AVG (GDPR Implementation Act) and Title 5.2 of the Awb (GALA) viewed together.

The Netherlands Court of Audit is another player. The latter is responsible for monitoring the government's expenses and receipts and has the authority to investigate the effectiveness and efficiency of the government's policies. Such researches into the policy pursued may also include investigations into the organization and functioning of the agency in question.

The Central Audit Service investigates national public administrations' financial and non-financial accountability and governance. If working processes and systems have an impact on financial management, then it also falls under the scope of supervision by the National Audit Service. An example of this is the non-compliance regarding the GDPR rules, because of the significant (financial) risk that this entails. The Nation Audit Service also supervises projects that fall under the Regeling Grote Projecten (Large Projects Regulation). In addition, the Central Audit Service conducts research at the request of ministers or institutes. For example, by conducting operational audits to investigate certain policy or operational processes, such as conducting research on the maturity of cyber security within the public administration on behalf of the CIO.

The Court of Audit and the Central Audit Service derive their supervisory powers from the Comptabiliteitswet.

Finally, the National Ombudsman deals with complaints about the conduct of national public administration, some municipalities, the police and independent national public agencies. The investigative powers are laid down in sections 9.2.1 up to and including 9.2.3 of the Awb (GALA).

After analysis of the general and specific legislation and regulations the researchers did not identify a legal gap in the supervisory competence. This is closely related to the fact that the use of algorithms is a means and therefore part of the way public administration executes its tasks. One could even speak of a stacking of supervision,, These supervisory organizations look at the same task of public administration from different supervisory angles. This isn't necessary a problem, when the various supervisory authoritiews view an event / incident from the perspective of their various supervisory duties and expertise.

Moreover, the investigative powers set out in the special legislation and regulations and in Title 5.2 of the Awb (GALA) are sufficient to be able to monitor algorithms. This also applies if use is made of algorithms made by companies whose intellectual property is to be protected. This has to do with the system of Title 5.2 of the Awb (GALA) and in particular the obligation that everyone cooperates fully with a supervisory authority which can reasonably demand it in the exercise of his powers. The same analysis is made with regard to the Court of Audit and the Central Audit Service. The investigative powers of these organizations stem from paragraphs 7.2 and 7.3 of the Compatibiliteitswet and article 5 van het Besluit Auditdienst Rijk.

This view is validated in the interviews with the supervisory authorities. In that context it was also noted that not gaining access to systems purchased from private parties can itself lead to a negative judgement. A single organization did, however, express the wish to update Title 5.2 of the Awb (GALA) by aligning it more with digital research.

Independent supervision

The supervisory authority serves the public interest from its *own* responsibility. The Netherlands Scientific Council for Government Policy report 'Toezien op publieke belangen' (Monitoring Public Interests) (WRR 2013) rightly points out that impartiality and the independence of supervision directed towards that of the field and management are essential conditions for this.

This is not only important for making informed judgments, but also for the credibility of supervision in the eyes of citizens. Impartiality and independence are also needed to strengthen the reflective function of supervision: meaningful and public talk can only be made in an environment where improper pressure is not exerted via explicit or implicit dependency relationships. Supervisory authorities must feel free to report unwelcome but essential facts and messages.

The GDPR requires independence of the supervisory authority . This is designed under national law by designating the Dutch Data Protection Authority as an independent public agency with legal personality and by including guarantees in this regard in the Uitvoeringswet AVG (GDPR Implementation Act).

The independent position of the Netherlands Institute for Human Rights, an independent public agency without legal personality, is based on resolution A / RES / 48/134 of the General Assembly of the United Nations and de Wet College voor de rechten van de mens (the Netherlands Institute for Human Rights Act).

The Court of Audit and the National Ombudsman are High Councils of State, the independence of which is based on Articles 78 and 78a of the Constitution.

For the Government Audit Service, the Comptabiliteitswet, in conjunction with regulations of the NBA and NOREA guarantees that it performs its duties independently and can form a professional opinion on the investigations.

The National Inspectorates, on the other hand, are not constitutional independent. To strengthen the National Inspectorates in their independent attitude, the Prime Minister established the instructions regarding the National Inspectorates on 30 September 2015. These instructions give substance to the scope for the National Inspectorates to collect impartial and independent information, to form an opinion and to report on it. This research does not cover the influence of these indications on day to day practice. More generally, it can be noted that, given the soft nature of the instructions, independence and impartiality in the performance of the inspection task depend primarily on being constantly alert maintain a certain attitude. Public accountability for the findings is an essential part of this.

4.2　To what extent is supervision of governmental use of algorithms currently being implemented?

This section will report on the results from the interviews to answer the second research question, namely to what extent is supervision of governmental use of algorithms currently being carried?

At Present

At present, the investigated supervisory authorities and the National Ombudsman are not used to performing structural investigations into the use of algorithms by public administrations. Although algorithms as a phenomenon are on the agenda of almost every authority, the performance is still fairly superficial. To date, with a few exceptions, it is limited to strategic explorations and the development of a vision on algorithms.

Vision on the supervision of algorithms

The supervisory authorities often fulfil their supervisory role in the same way. Analyses, selections and priorities are made in order to make an assessment, based on the risks detected, on which themes supervisory capacity is deployed and strategic decisions are made. This consideration involves the input of external parties, such as experts and scientists. This theme-oriented supervision interacts with responding to incidents and, where applicable, being able to respond effectively to complaints or enforcement requests from citizens.

An important part of the multi-annual plans and annual plans recognize the advances of AI, including the use of algorithms, within the supervisory field. The representatives interviews focused on strategic explorations of this phenomenon and the development of a vision on the appropriate supervision method.

The Central Audit Service alone has already taken further steps to develop a research methodology, the operation of which is validated using the supervisory field, before the methodology is applied in formal investigations. The inspection SZW is also somewhat ahead of the other organizations in its exploration. This is mainly due to the preparation of the new task in the context of the supervision of discrimination in the recruitment and selection process. The Court of Audit carried out an investigation into the use of learning algorithms by the tax authorities (Algemene Rekenkamer 2019).

The vision on the supervision of the other supervisory authorities focuses mainly on the first step in the series of interventions by supervisors appointed by Ayres and Braithwaite (Ayres and Braithwaite 1992). This first step involves convincing, instructing and advising the supervisory field in order to move the field to compliance. This is mainly aimed at removing uncertainties about how algorithms can be applied within suitable standards. On the other hand, this gives supervisory authorities the opportunity to gain insight into the way in which algorithms are used. These insights are useful when drawing up practical guidelines.

A dilemma does arise when looking at how one can give public administration the space to experiment with the use of algorithms without jeopardizing the role of the supervisor.

Organizational measures

In the context of this assignment, no extensive research has been performed into how the supervisory authorities prepare themselves to supervise the governmental use of algorithms. During the interviews, however, questions were asked about what is needed to make it possible to monitor and investigate algorithms and what measures these authorities have already taken in that context. A diverse picture emerges from the interviews.

The Netherlands Institute for Human Rights and the National Ombudsman do not currently have the people and facilities to analyze the operation of the systems themselves. The question that lies ahead is whether the organization itself must be technically competent or whether it is sufficient to control the matter to a certain extent and ask the right questions. The aim must be to obtain a sufficient picture of whether the system is fair and (with human intervention) leads to a proportional outcome and what consequences citizens will experience as a result. In that context, the Netherlands Institute for Human Rights points to the fact that, due to the limited budget, the institute must make very hard choices.

Given the nature of the supervision, the Radiocommunications Agency already has a great deal of technical knowledge and is now making an inventory of the area in which this expertise must be supplemented. This will enable the effective supervision of the use of algorithms.

Because of its supervisory role on the Wet computercriminaliteit, the Justice and Security Inspectorate has hired a data scientist. The inspectorate is used to work and review interdisciplinary. To fulfil its cyber supervisory duties, it also uses a platform where data scientists and other experts from supervisors exchange knowledge in the field of innovation. Given the size of its domain, the number of employees and the limited budget, the inspectorate must also make sharp choices. According to the inspectorate, if it really wants to shape the supervision of algorithms, additional financial resources whether allocated or not are required.

The Netherlands Court of Audit, the National Audit Service and the Dutch Data Protection Authority have specialist knowledge of, for example, data scientists, data analysts / data auditors and data engineers institutionalized in their organizations. These teams conduct independent research or offer support to content specialists, such as accountants and inspectors, when conducting research.

The authorities expressed difficulties to attract the right staff due to shortages on the labor market and the (lower) salaries of the government.

An important issue is that content specialists and data specialists must learn each other's languages.

For example, the (legal) definitions used in the policy documents and in the guidelines of the government are often not manageable or clear for data specialists in their work. The definitions are a simplification of the technical reality and offer insufficient starting points in practice. In addition, organizing mutual sharing of knowledge is of great importance in better understanding and cooperation.

The Netherlands Authority for Consumers and Markets and the Netherlands Authority for the Financial Markets have already gained some experience with regard to organizational measures.

Data specialist knowledge has been brought together in a data lab at the Netherlands Authority for Consumers and Markets. Every department supplies FTE to this lab. In the data lab the authority experiments itself on data-driven supervision. At the same time, data lab staff take part in research projects and collaborate with supervisors in order to gain knowledge of the field of supervision and to gain insight into issues related to the gathering of evidence.

The Netherlands Authority for the Financial Markets has a central team of data specialists. This team keeps in touch with the different teams in the primary process. In the primary process, market specialists and data specialists work together in teams. It is important that the same language is used as much as possible, so that market specialists can understand and question the data specialists from everyone's role. Cultural education is of great importance. In addition, knowledge is shared by internal education, to ensure that market specialists are able to ask the right questions about the working of the algorithm, the assumptions made and how they have been tested. If it is subsequently necessary that the systems are also looked into, the data specialists will do so. In this way the available capacity is used effectively. To be able to work in this way, a certain mass of FTEs and good facilities are needed.

What is striking in a positive sense is that data scientists who participate in the National Trainee Program (Rijkstrainee programma) work at a considerable number of these authorities. In that way data scientists have great opportunities to experience challenges in several branches in the national public administration.

Finally, it is worth noting that some of the supervisory authorities explore the use of algorithms and data driven strategies for their own tasks. In addition to legal and ethical aspects, this application also entails the responsibility for these organizations to take account of the human dimension, to be transparent towards the public and to be critical of their own actions. The critical questioning can be obtained by organizing checks and balances within the own agency and being 'auditable by design'.

Cooperation

Cooperation between the monitoring authorities is organized in various ways. The National Inspectorates are united in a Council of Inspectorates (Inspectie Raad).

Within this deliberation, knowledge is developed and disseminated, among other things, and their employees are encouraged to learn from each other and with each other, with particular attention to the change that digitization entails for inspectorates.

The Netherlands Authority for Consumers and Markets, the Netherlands Authority for the Financial Markets and the Netherlands Data Protection Authority take part, together with other supervisors of the private sector, in the Market Supervision Council. This partnership focuses (in part) on the functioning of markets and the behaviour of market players. Although each supervisor performs its own specific task, the participants regularly interact with each other. The partnership bundles the powers of supervisory authorities on joint themes and issues, including, for example, the impact of innovation on supervision.

The National Ombudsman and the chairman of the Dutch Data Protection Authority form part of the Advisory Board of the Netherlands Institute for Human Rights. Knowledge is also shared with Inspectorate SZW. The inspectorate also holds consultations with parties such as the Anti-discrimination Organizations, [the Institute for Social Research](#) (SCP), [Movisie](#) and [Labor Foundation](#) (Stichting van de Arbeid).

The Central Audit Service consults on the testing of algorithms with professional organizations such as [NOREA](#). The Government Audit Service also consults with the Court of Audit about the interfaces in the assessment framework based on the Comptabiliteitswet. The Radiocommunications Agency also has similar interfaces with, among others, the Consumer and Market Authority and with national inspectorates, such as the Inspectorate J & V. This also applies to the Data Protection Authority and the Consumer and Market Authority with regard to the Telecommunicatiewet and with the Radiocommunications Agency with regard to the eIDAS regulation. To prevent overlapping of supervisory actions by the various supervisory authorities, these organizations conclude cooperation arrangements.

Furthermore, these organizations work together to a greater and lesser extent internationally. At the Dutch Data Protection Authority, cooperation with European counterparts is regulated in the GDPR. This partnership draws up soft law in the form of opinions, among other things. These opinions, for example, explain and give substance to open standards from this regulation. These opinions guide the supervisors in the performance of their duties.

Apparently, there is no national platform in which knowledge is shared on a structural basis with regard to the monitoring of the use of algorithms.

4.3   Conclusion research questions 1 and 2

Research question 1: What is currently the legal basis for supervision?

Following the legislative analysis above, it can be observed that there is no legal gap within the supervisory competences.

This is closely related to the fact that algorithms are an instrument and therefore an integral part of the execution of tasks. The supervisory authorities also have sufficient investigative powers to conduct effective investigations.

Impartiality and the independence of supervision aimed at this is sufficiently legally anchored for these organizations, except for the National Inspectorates. For the National Inspectorates, the independence and impartiality in the performance of the inspection task mainly depends on being constantly alert to keep up the independent attitude. Public accountability for the results is an essential part of this.

Research question 2: To what extent is supervision of government algorithms currently being implemented?

At present, the supervisory authority and the National Ombudsman are not conducting a structural investigation into the governmental use of algorithms. Although algorithms as a phenomenon are on the agenda of almost every organization, the activities are still somewhat superficial. With a few exceptions, it is limited to strategic explorations and the development of a supervisory vision in this area.

The supervisory authorities seem to develop at different speeds in order to (further) prepare the organizations in terms of knowledge, staffing and facilities in order to supervise algorithms in a more structural way. In addition to financial resources, an important condition for better understanding algorithms is the need for data specialists and content specialists to better cooperate and understand each other's 'languages'. It government policy and guidelines is therefore considered important and useful for data specialists in their work.

In addition, it is important for the supervisory authorities to jointly share knowledge in the field of algorithms and their use.

A separate supervisory authority?

We therefore advice not to appoint a separate supervisory authority for the time being, for the supervision of the governmental use of algorithms. In this context, it is important to consider that the use of algorithms is one of the instruments by which public administration executes its tasks. The supervisory authorities supervise the performance and its quality of legal tasks. If public administration uses algorithms, it falls within the same scope. The specific knowledge of the field of supervision is also of great importance for the quality of supervision. However, because very little real experience has been gained with supervising algorithms to date, it is also recommended to evaluate in two years' time how it has evolved. After two years it can be assessed whether there is a common practice in supervising algorithms and whether that leads to new insights.

If, as a result of that evaluation, the decision is taken to designate a separate supervisor, the following should be taken into account. The independent position of the supervisory authorities means that they are free to come to their own judgment, including judgements on the use of algorithms.

These organizations are not obliged to follow the opinion of another supervisory authority, such as a supervisory authority of algorithms. This can have implications for the legal certainty that can be derived from the opinion of the individual supervisor by supervised agencies.

4.4   Reporting requirement for the use of far-reaching algorithms

Introduction

In the motion of 10 September 2019, Kamerstukken II, 2018/19, 26 643, no. 632, adopted by the House of Representatives, members request the government to include a reporting requirement for the use of far-reaching algorithms in the plan to implement supervision on governmental use of algorithms. According to the authors of the motion, the government does not have a good insight of the development and deployment of all algorithms by public administration.

During the interviews, the initiative for such a reporting requirement was also discussed. Respondents acknowledge that the government and the authorities themselves do not have a good insight of the development and deployment of algorithms by the government. There are, however, many doubts about the effectiveness of the reporting requirement and one wonders whether it is better to fit in with existing instruments.

Effectiveness of reporting requirement

The imposition of a reporting requirement for the use of far-reaching algorithms can add value in providing insight into and controlling the governmental use of algorithms. The insight can also be used by supervisory authorities in the preparation of risk analyses, it can be useful to the public debate and a reporting requirement can strengthen the supervision of the House of Representatives.

On the other hand, the definition of what a far-reaching algorithm is raises many questions. Are these only algorithms in which personal data are used, or are they also used by research centers, such as the Carbon Tax model, or algorithms used in decision support systems of Rijkswaterstaat about the closing of, for example, the Maeslant barrier, in which personal data are not processed? Or should it only concern algorithms used in the context of automated decision-making? How is assessed whether or not an algorithm should be reported? Moreover, as noted earlier, the invasiveness of an algorithm is not only determined by the model itself, but also by what is done with the results of the algorithm.

Furthermore it can be problematic to guarantee the completeness and accuracy of the list of reported algorithms in practice. The same goes for keeping it up to date. It may enable to give false certainty. These concerns are supported by the researchers. After all, reporting the use of algorithms does not make it legal. The same problem occurred when there were reporting obligations under the predecessor of the GDPR. No legality check was linked to the inclusion of a report in the register of the Dutch Data Protection Authority.

Nonetheless, the sole registration was assured by organizations and citizens that the processing was found to be lawful by the Data Protection Authority.

Prior Consultation

What is often mentioned in the interviews is the notion that it is important that organizations that develop and apply algorithms have to take their own responsibility for the choice to use algorithms. In addition, they must ensure that the application is necessary and lawful and that the choices made and the operation of the model are traceable and therefore auditable. The researchers endorse this. To enable management to take responsibility it is an option to enforce to carry out algorithm impact assessments in advance and, if a high risk remains for those involved, to consult the domain-specific supervisor beforehand. This resembles the Data Protection Impact Assessment (DPIA) and the tool of prior consultation, as already included in the GDPR. A similar system for presenting the application of an algorithm in advance can also be found in the European regulations on capacity allocation and congestion management in the energy sector that apply to the energy sector. (Regulation establishing guidelines on capacity allocation and congestion management, (EU) 2015/1222, L197 / 24). See also https://www.acm.nl/en/publications/publication/14563/Power-exchanges-can-apply-for-participation-in-method-for-capacity-calculation. The application of algorithms must be submitted to the Authority for Consumer and Market in advance.

If algorithms are used by public administration, it could be an option to enforce publication of the algorithm impact assessment in relation to the prior consultation. In that case the whish for more transparency and accountability can be complied because it would enable House of Representatives, city councils, supervisory authorities, journalists, civil rights groups and others to monitor activities.

If an overview of far reached algorithms is nevertheless deemed desirable, the prior consultation could serve as a distinctive criterion. This counteracts the aforementioned false certainty, because the legality of these algorithms can in principle be assumed. It must be investigated whether such an overview is feasible in view of the implementation costs.

5.   Policy advice

This section answers the last research question, namely which policy advice can be given based on the results of the study?

The discussions with the supervisory authority and the session with the board reinforce the view that supervision alone is insufficient. If the policy and the implementation of an administrative body are no longer in process descriptions or work instructions but are replaced by algorithms, more mechanisms should change with it. After all, discretion has shifted.

> Example: Scan cars and ANPR
>
> If a municipality asks public servants to enforce parking regulation by issuing fines for parking without paying, there will be a legal regulation, handbooks, and officials will be expected to behave in a certain way. There are various ways to ensure that the government acts lawfully and properly. If these officials are replaced by algorithms because the scan cars scan the license plates and the automated system imposes fully automatic fines, a large part of the government's actions will be transferred to the automatic systems. These will also have to work lawfully and carefully. In order to guarantee that, other mechanisms are needed and the usual checks and balances must be evaluated to ensure their effectiveness.

These shifts require an approach in which both the democratic and public legitimacy of algorithms must be elaborated and the way in which the executive power relates to algorithms. In addition, the relationship between the executive branch (and the supervision thereof) and science is also important. The policy advice presented below provides a first guide to arrive at a more detailed interpretation thereof. However, such an approach still requires substantial further investigation.

5.1. Introduction

Reference was made earlier to the National Trainee Program, from which data scientists gain experience at several organizations. In line with this, it is recommended to continue along this path and to make the government an attractive employer for these specialists too. After all, this knowledge and experience is essential for the government to respond to all developments in the field of AI. Ensure that potential obstacles are removed to allow these specialists to work together in a meaningful way and to further stimulate this collaboration.

Cooperation in the field of AI is certainly also important for the supervisory organizations. Encourage cooperation there too, for example by means of a joint platform for supervisors where not only knowledge can be exchanged, but from which, for example, joint factual research into a phenomenon, such as algorithms, can be done.

5.2. Democratic Legitimacy

Legislative process

It is suggested to conduct further research into how the democratic legitimacy of the use of algorithms can be strengthened. If (local) governments execute laws digitally, they make an interpretation of the law that then applies for a long period and is applied to all cases. This mainly concerns the algorithms that were mentioned first in section 3.1. This quasi-legislation now hides from the field of vision of, for example, the House of Representatives or the City Council. To prevent this, use could be made of the aforementioned model that Lokin developed for this purpose (Lokin 2018).

She studied a method by which legislative texts are written in a very structured and precise manner to make the programming more easy. The discretion on how to interpret the law, will then (again) be part of the democratic checks and balances In this way insight can be given at an early stage into the choices that are made when drafting the law that must be implemented automatically. This could also form part of the request for consultation or the formal request for advice from the Council of State and the other legislative advisors. The members of the House of Representatives or the City Council could also shift their attention and, in their role as co-legislators, ask for an explanation of the automated transformation of a proposal for an act or local regulation.

Framework

It is suggested to formulate general standards, to which the governmental use of algorithms must at least comply and which are manageable not only for lawyers and policy staff, but also for data specialists. These general standards serve as a testing framework that guide the development and application of algorithms. When drawing up those general standards, involve data specialists. These general standards serve as a testing framework that offers a handle in the development and application of algorithms. These standards can also be used in a general sense for which the application of algorithms by the government is deemed desirable. Incidentally, such standards do not relieve individual government organizations from their own responsibility to consider whether and to what extent algorithms are applied for a specific issue and how they are implemented in that case. In a specific case, a government organization ensures that the use of algorithms is efficient, lawful, fair, accurate and explainable. This duty of care will be explained in more detail below.

5.3 Executive powers

The responsibility for the assessment and ultimately the decision to use algorithms for the execution of a legal task lies with the public managers and the political or governmental responsibility. It is therefore up to them to be accountable for this and to demonstrate that the applicable regulations are being complied with. For this it is essential that an organization is in control. Prof. Lisette van der Hel-van Dijk pointed out that the supervisory authority could ask about risk management. Which risks are distinguished? What are the control measures (what are the hard and soft controls) and how is it monitored?

Duty of care

It is recommended to introduce a legal and explicit duty of care for public administration using algorithms. Every public agency must then ensure that the use of algorithms is efficient, lawful, fair, accurate and explainable. It is the responsibility of the public administration that decides to design or buy algorithms and use them, to comply with this duty of care and demonstrate this.

A duty of care does require that government organizations are in control of the use of algorithms and that they can account for this internally and externally. It is suggested to prepare a manual.

This manual can support public administration in setting up a control system. Such a system can help to ask the right technical, legal and ethical questions, both when purchasing or developing algorithms and when applying them, to document the answers and to organize counter partnering in the form of checks and balances. The wheel does not have to be reinvented: the principles of good administration and the protection of fundamental rights should be the compass.[4]

It is important here that, at an early stage, when purchasing or developing, attention is paid to the explainability of the algorithms, to be *accountable by design*. Certainly with the more complex algorithms, that can be difficult, as follows from the conversation with Prof. Tom Heskes. With a learning algorithm, for example, the model changes every time the dataset changes. How the dataset in combination with the learning algorithm leads to a model, is in most cases difficult to explain at detail level, at most at meta level. But if you decide to use the the model then you can use existing methods to explain well which (input) variables have a (large) influence on the outcomes of the model, what the accuracy of the model is, which bias is still in it, etcetera.

Amsterdam

In Amsterdam, the city administration was increasingly confronted with algorithms. The route planners did not always guide cars and tourists via the most suitable and safe roads or intersections and there were concerns about Uber's rise. The municipality of Amsterdam had to develop expertise to deal with this. (https://www.amsterdam.nl/bestuur-organisatie/college/wethouder/sharon-dijksma/persberichten/gemeente-uber-maken-afspraken-veiligheid/).

The awareness and accumulated expertise also ensured that the systems and innovations of the municipality of Amsterdam itself came to the fore. Collaboration with professor Sander Klous (UvA and KPMG) led to the framing of the development and use of algorithms according to the long-standing methods in risk management. The auditability of the algorithms is the starting point. The municipality also plans to require suppliers of algorithms to the municipality of Amsterdam to be auditable.

In addition, a process and assessment framework can be worked out in the control system when and how accountability is given internally in the hierarchical line. A risk-based approach can be based on the assessment framework, in which attention is paid to complexity and impact.

Such a method of internal control enables a supervisory organization to take the internal control system as a starting point for supervision and to supervise it on a management basis. However, it is important to periodically check the operation of the method of internal control in action.

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[4] * it can be useful to learn from other countries, in this case France (not in the original report)
https://www.etalab.gouv.fr/algorithmes-publics

Algorithm impact assessment

It is suggested to oblige organizations that want to use algorithms, even when personal data is not at stake, to have an impact assessment carried out before the decision is made to use them. This tool helps organizations to identify risks, mitigate them and check whether risks remain high. If so, we suggest the organization requests prior consultation from the designated supervisor (like the mechanism in GDPR). If an impact assessment algorithm is part of the drafting of acts or regulations, it can be submitted to the legislator and legislative advisors like the Council of State (advisory body of legislation) of with the proposal.

The human dimension

In many case the use of algorithms of the government will impact humans. In that case it is advised to create more awareness in public administration as the executive branch that the application of a policy or algorithm gives an obligation to check on the basis of the result whether this is in accordance with the principles of good administration. In the Netherlands, established in GALA, there is a so called *inherent competence to deviate* from the formal policy rules. If public administration decides not to use this competence in an individual case, it needs to state reasons for this decision. This inherent room to deviate should definitely be taken into account when using algorithms.[5]

Organize human intervention in such processes and promote that deviation from the result is desirable if this leads to an improper outcome in relation to the purpose of the policy / regulations involved.

Periodic audits

It is recommended that organizations that make use of algorithms are periodically audited by an external party, focused on design and operation of the algorithms (1) and whether they still serve the purpose for which they were used (2), whether the human dimension is taken into account (3) and whether the method of internal control still functions adequately (4).

5.4.   Relationship executive power and supervision

Experimenting space

It is important for public administration to know how the use of algorithms fits in with existing legislation and regulations. The deployment of the supervisory authorities will primarily be aimed at providing explanations in that regard. The question is whether in a phase where the application of algorithms is in full development and the supervisory authorities themselves are also learning, it is sufficient to provide legal certainty and promote compliance.

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[5] * Not mentioned in the original report but useful in this translation, one could think of introducing mechanisms that work like hard ship clauses

It is suggested to explore the possibility of room for experimentation for public administration in the field of the deployment of algorithms, whereby both the public administration and supervisory authorities can learn from each other. Such a "free" space is important because it is not clear in advance whether the activity is actually legitimate.

A possible unlawful activity is at odds with the principle of enforcement in the Netherlands. Pursuant to this principle, the supervisory authority must take enforcement action if a violation is found. Offering experimentation space can be part of the assessment of a prior consultation. It is even possible to ensure a legitimate basis under the wings of the legislator (including the parliament) (Jacobs 2018). It is, however, important to set conditions for:

   o the nature of the initiatives that can participate,
   o the extent of the experiment,
   o the role of the supervisory authority and for guarding its boundaries therein,
   o the way the experiment can be inspected / checked,
   o the way in which accountability is given to the citizen.

From the interview with Prof. Judith van Erp and Lauren Fahy it follows that in the United Kingdom the Financial Conduct Authority has already gained extensive experience with regulated experimental space.

5.5. Public legitimacy

Public debate

The digitization of society and in particular the use of algorithms can lead to public values coming under pressure. It is of great importance that there is a public debate about the impact of this on society. For this, citizens must also become aware of what the consequences of that transition can be for them. In addition, journalism and interest groups are also important actors in an open and democratic society (informal supervision). They also play a role in monitoring public administration. It is advised that the government initiates this, is open about the issues and involves interest groups from the start.

Transparency in action, not just in words is a first requirement. But it is also about handling different levels of transparency. In order to be able to reflect on the use of algorithms and the context in which they are applied, explanation must provide sufficient support both at technical and legal level. This applies not only to external experts, but also to citizens. Citizens must be informed about the algorithms with which they are confronted in social intercourse with the government and must be able to form an opinion on this. This can be done by providing information on the website following a prior consultation or as a permanent part of the annual report.

5.6   Science

Use of the knowledge from science

In practice, it appears that technological innovation cannot be viewed separately from revenue models and regulations; these develop in mutual cohesion (De Jong, Kool & Van Est 2019). It is certainly not inconceivable that Dutch society has other interests than the large tech companies (Nemitz 2018). Consider, for example, the retention of the idea that it is inevitable that machine learning has applications where it is no longer possible to explain what is happening: the so-called black box, a view that has been heard frequently lately. This is not necessarily endorsed by scientists: human choices behind algorithms are generally easy to explain, as was also apparent from the interviews with AI scientists in this study. This underlines the importance of being well connected to the scientific debate on AI. It would improve the effectiveness and usefulness of these recommendations if this is done in an interdisciplinary manner. This is necessary to bring the various worlds together and to learn from each other. We therefore recommend setting up and appointing a committee, following Germany's example, consisting of a wide range of scientists and experts for a well-founded vision of future use and supervising the governmental use of algorithms.[6] It is advised that the first question for this committee would be to create a joint vocabulary such as an answer to questions as: what do we mean by bias, auditability and transparency?

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[6] De Datenethikkommission: https://datenethikkommission.de/

Appendix 1: List of documents

Parliamantary documents

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Appendix 2: List of interviewees

Organizations

Authority for Consumers and Markets
Authority Financial Markets
Court of Audit
The Netherlands Institute for Human Rights
Inspectorate J & V
Inspectorate SZW
National Audit Service
National Data Protection Authority
National ombudsman
Municipality Amsterdam
Radiocommunications Agency
Review Committee on the Intelligence and Security Services

List of experts

Prof. dr. Judith van Erp, professor public institutions Utrecht University.
Lauren Fahy, PhD fellow Successful regulation of emerging technologies, Utrecht University.
Prof. dr. Lisette van der Hel – van Dijk, Nyenrode University.
Prof. dr. Tom Heskes, Professor AI, Radboud University.
Prof. dr. Sander Klous, professor Big Data ecosystems for Business and Society, University of Amsterdam.