REPORT

USE OF ALGORITHMS THAT PROCESS PERSONAL DATA BY DUTCH ORGANISATIONS

On behalf of

Autoriteit Persoonsgegevens (AP) (Dutch Data Protection Authority)

December 2024

CONSIDERATI DEEPLOY

Management summary (1/7)

On behalf of the AP, Considerati B.V. and Deeploy B.V. conducted a study into **the use of algorithms that process personal data by Dutch organisations**. The aim of the study is to gain insight into the current application of these algorithms and to assess the maturity level of these organisations in dealing with such algorithms.

The study used a proportional random sample based on company size and sector, among **5690 Dutch organisations** registered with the Chamber of Commerce. Due to the lack of accurate registration of government agencies in the Chamber of Commerce, these were not included in the study. **1612 organisations participated** in the study by completing the online survey. These results were analysed quantitatively and qualitatively. The **following conclusion** summarises the results of the study:

Conclusion

44% of participating organisations use algorithms, **but the maturity level in setting up the governance of these algorithms is low.** In addition, structurally identifying and mitigating risks is in many cases not yet standard practice. Many organisations consider the algorithms they use as non-essential to their business operations. They also rarely use them to make decisions about individuals and make limited use of special categories of personal data. **Smaller organisations with 5 to 100 employees are a point of concern** as they often do not have an internal supervisor, do not perform risk analyses and do not take risk-mitigating measures. **Organisations with more than 500 employees in the financial sector also require extra attention** due to the frequent use of algorithms for decision-making about individuals within this sector.

Management summary (2/7)

The preceding conclusion is supported by the following partial conclusions:

Significant use of algorithms with limited business relevance	Almost half of the participating organisations use algorithms, but **only 6% consider the use of algorithms to be 'very important'** for the functioning of the organisation. This suggests that there is still a lot of value to be created with algorithms within organisations and that we can expect an increase in both the use and relevance of algorithms in the future. (See Chapter 2)
Mainly simple rule-based algorithms are used	**Rule-based algorithms are the most widely used type of algorithms**. In addition, it is striking that no less than 43% of respondents do not know what types of algorithms are used. This indicates a possible lack of knowledge about the types of algorithms that organisations use. (See Chapter 2)
Low maturity in algorithm governance	Organisations often assess the maturity of their algorithm governance as **'limited' or 'situational',** indicating that maturity is often low. This requires improving knowledge and developing more robust governance structures to ensure responsible algorithm use. (See Chapter 4)

Management summary (3/7)

Conscious risk management is not yet standard practice

Risk analysis, algorithm monitoring, and risk mitigation measures are **not yet standard practice** in about half of organisations. Especially in smaller organisations, there is a lack of conscious approach to risks. Among those organisations that do identify risks, **privacy breaches or data breaches and incorrect or irrelevant output** are the most commonly identified risks. (See Chapter 5 and Chapter 6.2)

High dependency on third parties requires attention

65% of organisations purchase the most impactful algorithm they use **from a third party**. This means that organisations are dependent on third parties when it comes to developing algorithms. This dependency raises questions about, among other things, responsibility, transparency and protection of personal data. (See Chapter 6)

Special categories of personal data, especially in medical applications

In **11% of organisations, special categories of personal data are used** in the algorithm with the greatest impact. **In 74% of medical applications** special categories of personal data are used. Their use requires extra attention to the protection and responsible use of these data. (See Chapter 6)

Management summary (4/7)

Based on these conclusions, Considerati B.V. and Deeploy B.V. make the following recommendations to the AP:

- **Raise awareness about the opportunities and risks of algorithms.** The study shows that many organisations are not yet taking advantage of the opportunities offered by algorithms. It also appears that consciously dealing with the risks of algorithms is not yet standard practice. Furthermore, it appears that organisations find it difficult to determine the type of algorithm they use. This indicates a lack of knowledge. The AP can encourage the adoption of reliable algorithms by increasing awareness of the opportunities and risks of algorithms. With regard to the prudent and lawful application of algorithms, the obligations under the AI Act provide the most logical framework for information provision. The measures prescribed by the AI Act are also useful for non-high-risk AI systems.
- **Pay extra attention to SMEs.** In small and medium-sized organisations, the governance of algorithms is least robust. Explore how the AP, together with other supervisory authorities and stakeholders, can help SMEs with the lawful and careful application of algorithms.

Management summary (5/7)

- **Collect best practices together with leading organisations, with a focus on risk identification and monitoring.** We recommend initially focusing on the theme of risk identification and monitoring for algorithms in which personal data are processed, as we see that a large proportion of organisations (43%) do not identify risks prior to using them and only 8% of organisations identify risks during use. As a result, risks may go unnoticed, which could lead to harm to individuals. In order to collect best practices, we recommend entering into discussions with leading organisations, such as those we see within the Culture, Recreation and Other services sector in organisations with more than 500 employees and in the Information and Communication sector with more than 2000 employees. They use many algorithms and perform risk identification.
- **Facilitate the use of regulatory sandboxes for AI systems.** Regulatory sandboxes provide space for organisations to experiment with AI (a subcategory of algorithms) in a controlled manner, according to the EU AI Act. If the AP facilitates these regulatory sandboxes and is closely involved, this can provide valuable insights for drawing up best practices and further shaping targeted supervision.

Management summary (6/7)

- **Encourage the appointment of an internal algorithm supervisor within organisations.** Nearly half of organisations have not yet appointed an internal algorithm supervisor or have not been able to determine if they have. By appointing an internal algorithm supervisor, internal awareness of algorithms and their risks can be increased. For example, organisations can appoint an algorithm, AI or ethics officer or assign this role within the privacy team. Smaller organisations can also assign this responsibility at management level. The internal supervisor can then be equipped with best practices from the AP on how risks can be identified and monitored.
- **Special focus on medical applications.** 74% of organisations that use algorithms for medical applications use special categories of personal data. Since these are applications with potentially high impact on individuals, they require special focus. The AP can achieve this by tightening supervision of organisations within the medical sector or by offering these organisations more tools.
- **Special focus on financial services organisations with more than 50 employees.** In this sector, 50% of organisations with 50 to 99 employees and approximately 55% of organisations with more than 500 employees use algorithms to make decisions about individuals. Since these are applications with potentially high impact and risk on individuals, they require special focus. The AP can tighten its supervision of these organisations to achieve this.

Management summary (7/7)

- **Awareness and monitoring of third-party relationships.** Most organisations (65%) purchase algorithms from third parties. However, hardly any risks are identified regarding the dependency on these third parties. Also in light of the upcoming obligations for users in the AI Act, it is important that purchasers understand what algorithms they purchase and what conditions apply to their use. They must also be aware of potential privacy issues such as security and data transfer. The AP can contribute to this awareness and, together with other stakeholders, develop tools such as vendor assessments, compliance checklists and points of attention for purchasing conditions. In its supervisory role, the AP can monitor compliance with the GDPR.

- **Conduct further studies on organisations that use algorithms to make decisions about individuals without human intervention.** 7% of organisations that deploy algorithms use the algorithm with the greatest impact on individuals to make decisions about individuals, without human intervention. This is not permitted in certain cases under Article 22 of the GDPR. The AP can conduct further studies into this and take action if necessary.

- **Periodically assess how the theme of algorithms is developing within organisations.** This study is a baseline measurement in gaining insight into organisations that use algorithms in which personal data are used. It is recommended that this study, or a condensed version of it, be repeated periodically. This allows the AP to monitor how the use of and handling of algorithms by Dutch organisations is developing.

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1. Background and objective

Background

At the request of Autoriteit Persoonsgegevens (AP) (Dutch Data Protection Authority), Considerati B.V. (Considerati) and Deeploy B.V. (Deeploy) conducted a study among **Dutch organisations** registered with the Chamber of Commerce. Due to the lack of accurate registration of government agencies in the Chamber of Commerce, these were not included in the study.

The AP wants to obtain a detailed picture of **the use of algorithms by Dutch organisations**. This specifically concerns algorithms **in which personal data are processed**. The study should provide more insight into the extent to which organisations use algorithms, the purpose for which algorithms are used, which personal data are processed during such use and how the algorithms are developed. In addition, the AP wants insight into the level of maturity of organisations in dealing with algorithms, how organisations assess risks and the extent to which organisations take effective measures to mitigate those risks.

The results of the study provide the AP with insight into how it can best organise its supervision of the use of algorithms and for which topics organisations may need more support.

Implementation

1. Achtergrond en doelstelling

This report presents the results of a study into the use of algorithms by Dutch organisations.

The study was conducted based on the results of a survey that was shared with the various organisations. Based on the answers provided by organisations to the questions in the survey, the outcome is described and analysed in this report. The questions from the survey are divided into different topics and form the themes of the chapters (see Table of Contents).

For each chapter, the results of a selection of survey questions that apply to that theme are analysed and discussed. We complete the study report with the conclusions and recommendations.

Definitions

Algorithms: algorithms have been defined as *"A set of instructions that a computer follows automatically to solve a problem or answer a question"* for this study.[1]

- The study focuses on the use of algorithms in which personal data are processed. This may involve regular' personal data and special categories of personal data.
- In the report, algorithms refers to **algorithms that use personal data**. For the sake of readability, we will simply refer to them as 'algorithms' hereafter.

Personal Data: any information relating to an identified or identifiable natural person.

Special categories of personal data: "The GDPR explicitly defines 'special' categories of personal data. Special categories of personal data are data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership, genetic data, biometric data for the purpose of uniquely identifying a person, health data, or data relating to a person's sexual orientation.

[1] Aandacht voor algoritmes. (2021). Netherlands Court of Audit.

Objective and study questions

Objective

Gaining insight into the current **application of algorithms in which personal data are processed** by Dutch organisations and **assessing the maturity level** of these organisations with regard to the design of the governance of algorithms.

This objective has been translated into the following study questions:

- To what extent do Dutch organisations use algorithms?
- What are the key characteristics of organisations that use algorithms?
- What are the characteristics of the algorithms used?
- What is the level of maturity with regard to the responsible use of algorithms among Dutch organisations?
- How is the use of algorithms monitored within organisations?
- To what extent do organisations perform risk analyses when using algorithms?
- To what extent have organisations that use algorithms taken risk-mitigating measures?

These questions are answered in the various chapters.

Method (1/2)

Target group

The study was conducted among Dutch organisations, with more than 5 employees, registered with the Chamber of Commerce and with their head office in the Netherlands. Due to the lack of accurate registration of government agencies in the Chamber of Commerce, they were not included in the study. The target group consists of **120,868 organisations.**

Sample

A proportional sample was drawn based on company size (number of employees) and branch of industry from 5690 organisations (see Appendix for more information about the sampling). In total, **n=1612 organisations** completed the survey. The response rate is 28.3%.

Representativeness

The net sample of n=1612 is not representative for sector and company size.

Therefore, caution should be exercised when drawing conclusions about the entire target group based on the results. See pages 18 to 20 for more information about the sample versus the entire target group.

Survey and data collection

The survey consists of 30 questions and was completed online by respondents via EUSurvey.
Respondents were invited by letter to complete the survey, and were reminded by a second letter, the reminder letter, to complete the survey in time.
The survey was structured conditionally, meaning that organisations that do not process personal data or do not use algorithms did not have to complete all questions.
Above each graph, it is indicated which group was used as the basis for the analysis.

Method (2/2)

Analysis of results

The process of cleaning the data can be found in the appendix. The majority of the survey consists of closed questions, which have been quantitatively analysed. The survey also contains two open questions, namely a **description of the algorithm** with the greatest impact on individuals and **which risks have been identified** when using this algorithm. These have been analysed qualitatively. The relevant method is described below.

Frequency registration

Using frequency registrations (tallying), we identify **themes and risks** mentioned by respondents per usage category of the algorithm (such as administration, customer service or marketing). This approach also allows us to systematically determine the frequency of specific themes and risks.

Identification

After this analysis, we can identify the most common themes and risks per algorithm application area and understand how frequently they occur. This approach provides insights into the use of algorithms in **different application** and can help develop targeted strategies to manage risks.

2. Respondent information

Respondent information

Introduction

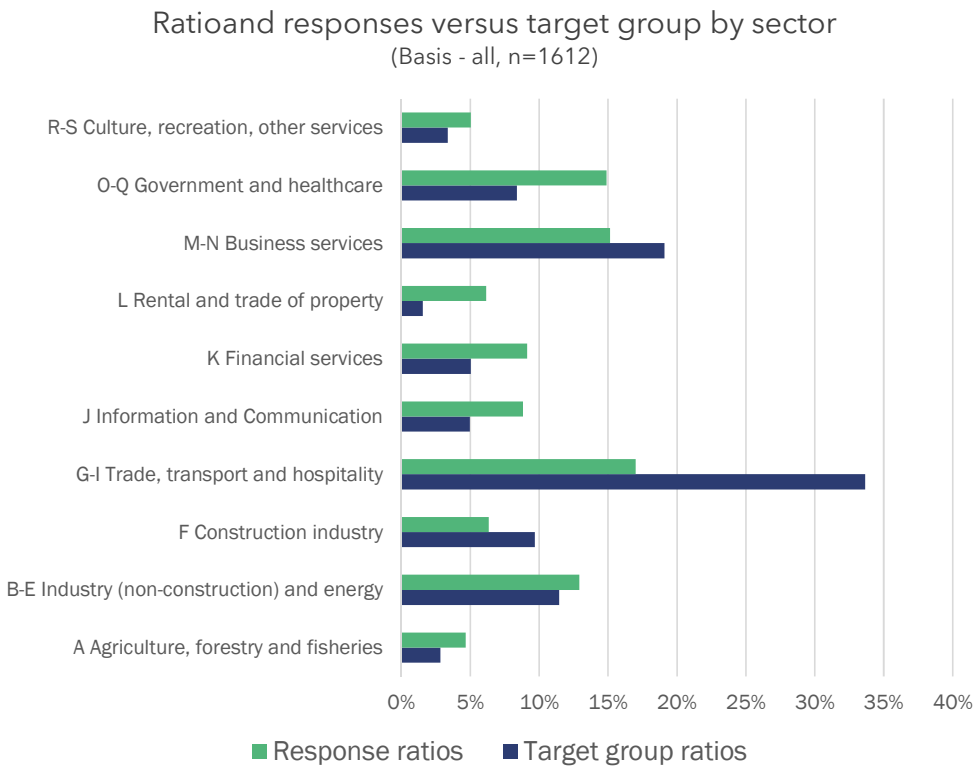
In total, **5690 organisations received an invitation for the survey**, of which **1612 organisations participated**. The organisations that were invited differ in size and the sector in which they operate. This chapter provides information about the various organisations that participated in the study.

Key points:

1. **The ratio of sectors in the responses differs from the target group.** We see a difference in the ratio of the different sectors in the responses versus the ratio in all Dutch organisations with more than 5 employees registered with the Chamber of Commerce.
2. **Relatively many larger organisations participated in the survey.** Small organisations with 5 to 19 employees are significantly underrepresented, while organisations with more than 50 employees are overrepresented in the responses.

The ratio of sectors in the responses differs from the target group's composition

2. Respondent informatie

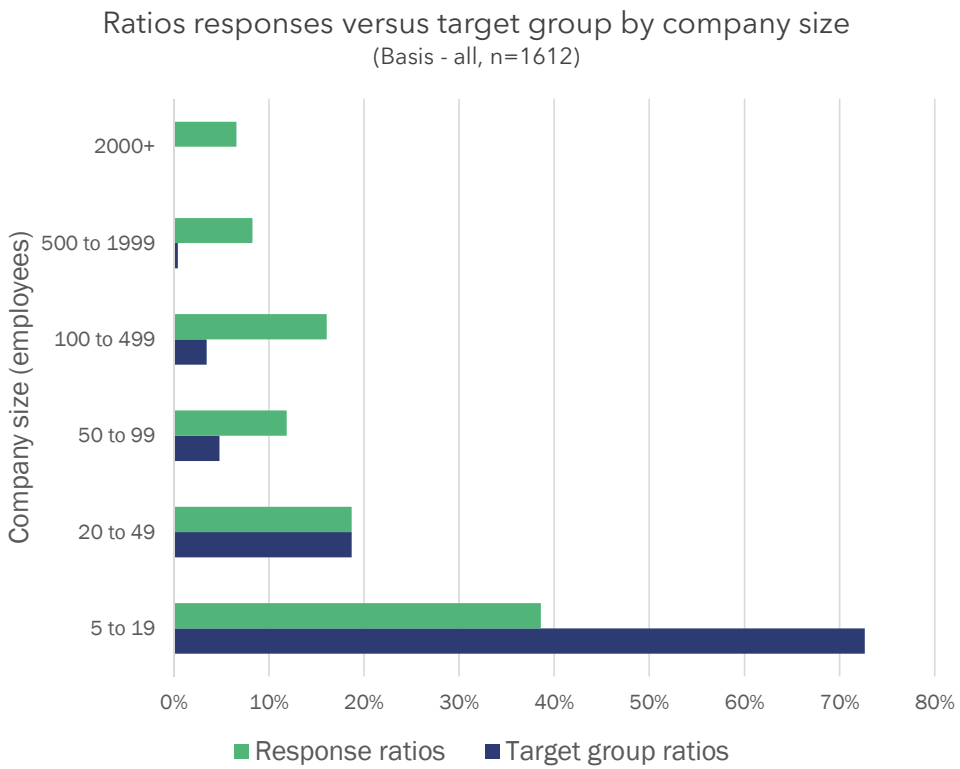


Explanation:

- At 17%, organisations in the **G-I Trade, transport and hospitality sector are highly underrepresented in the responses** while they comprise 34% of the target group.
- At 15%, organisations in the sectors **O-Q Government and healthcare** (15% in responses compared to 7% of the target group), **L Rental and trade of property** (6% in responses compared to 2% of the target group), **K Financial services** (8% in responses compared to 5% of the target group) and **J Information and Communication** (8% in responses compared to 5% of the target group) **are highly over-represented** in the responses, while they comprise 7% of the target group.
- Due to the deviations in the ratios of the responses compared to the target group, **caution must be exercised when generalising the results** to the totality of Dutch organisations.

Relatively many larger organisations completed the survey

2. Respondent informatie

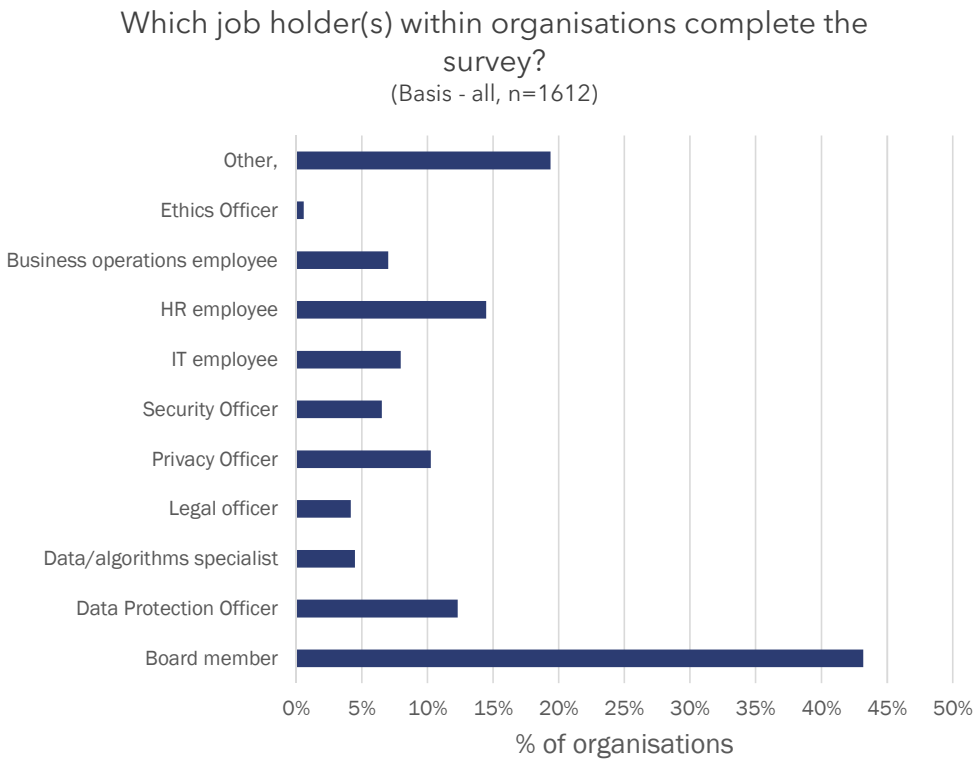


Explanation:

- **Small organisations** with 5 to 19 employees **are strongly underrepresented** in the responses. Approximately 38% of the organisations that responded fall into the category of '5 to 19 employees', while this category comprises 73% of the target group.
- **Organisations** in all categories with more than 50 employees **are in fact strongly overrepresented** in the responses compared to the target group.
- Due to the deviations in the ratios of the responses compared to the target group, **caution must be exercised when generalising the results** to the totality of Dutch organisations.

Mainly board members completed the survey

2. Respondent informatie



Explanation:

- The invited organisations were asked to have the survey **completed by the person within the organisation who has the most knowledge** about the algorithms used and how they are deployed within the organisation.
- The graph illustrates that **a diversity of job holders** within organisations complete the survey, with a **clear majority of board members**. Board members of a staggering 43% of organisations completed the survey.
- It is striking that many other job holders also completed the survey: 20% 'other', 15% 'HR employees' and 13% 'Data Protection Officers'.
- This indicates that the theme of **algorithms can affect multiple disciplines within an organisation**, from management board to legal and technical experts.

3. Algorithms and areas of use

Algorithms and areas of use

3. Algoritmes en gebruiksgebieden

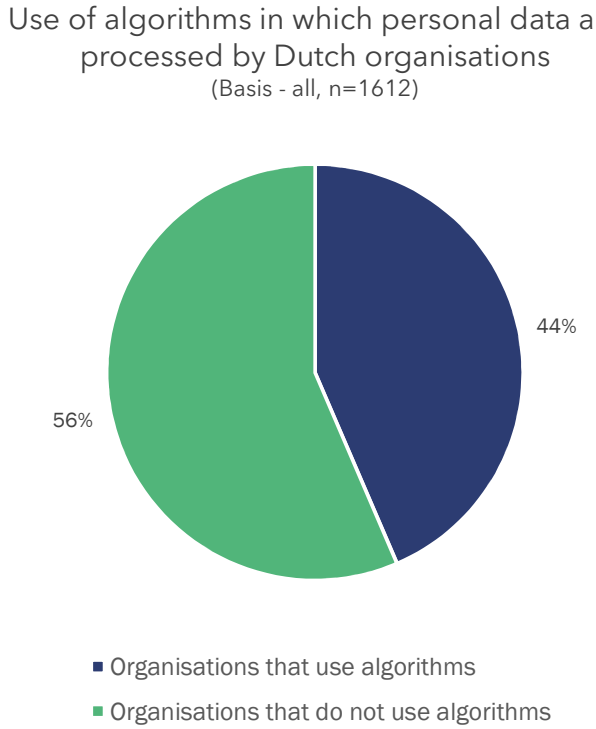
Introduction

In this chapter, we provide insight into the extent to which organisations use algorithms. We also compare the use of algorithms between different sectors and company sizes. We also analyse in which areas of use algorithms are applied within organisations.

Key points:

1. **Algorithms are widely used, but considered unimportant.** Although algorithms are used in every sector, and larger organisations in particular use algorithms more often, many organisations do not consider their algorithms important to the functioning of the organisation. For the largest organisations (2000 or more) in sectors B-E Industry and Energy, J Information and Communication and K Financial Services, algorithms are important.
2. **Many administrative algorithms, but knowledge about the type of algorithm is lacking.** Most algorithms are used for administrative purposes. Organisations often use relatively simple, rule-based algorithms, but have often been unable to determine which types of algorithms they are using.

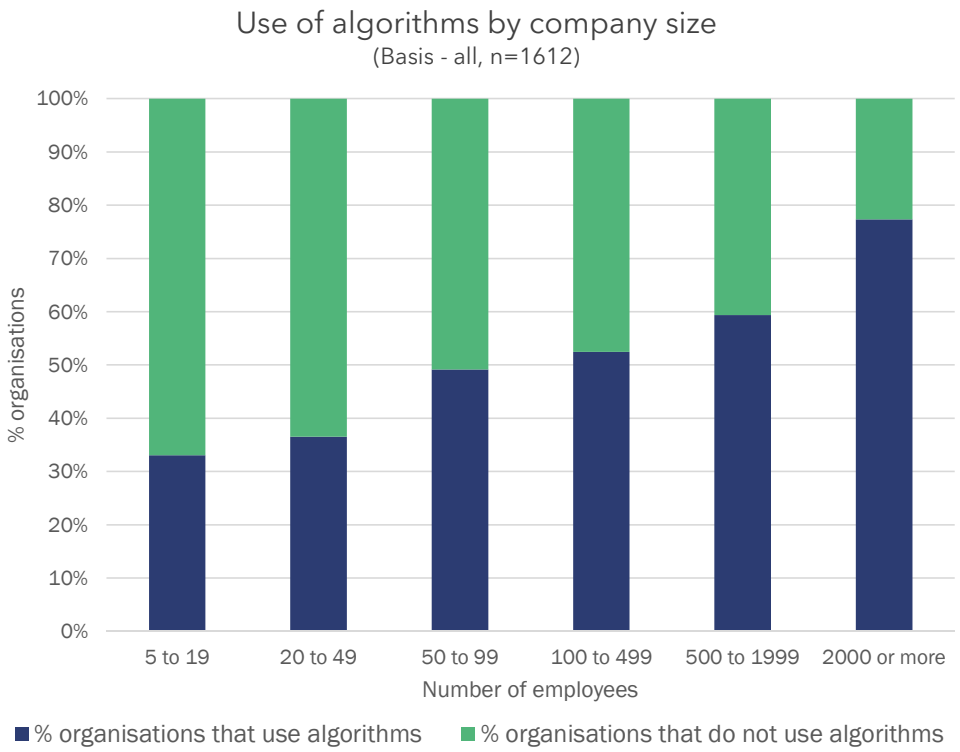
Nearly half of organisations use algorithms



Explanation:

- With 44% of organisations using algorithms, it is clear that **a relatively large proportion of Dutch organisations use algorithms**. This illustrates a growth in automation of various business processes and algorithmic decision-making in the Netherlands.
- There are also a **significant number of companies that do not use algorithms** , namely 56%. This may be due to a lack of necessity, resources, knowledge or a conscious choice due to concerns about privacy, ethics and/or the risks associated with algorithms. There is also a **possibility of underreporting**, where organisations may be using algorithms but not recognise this or have not fully understood the survey.

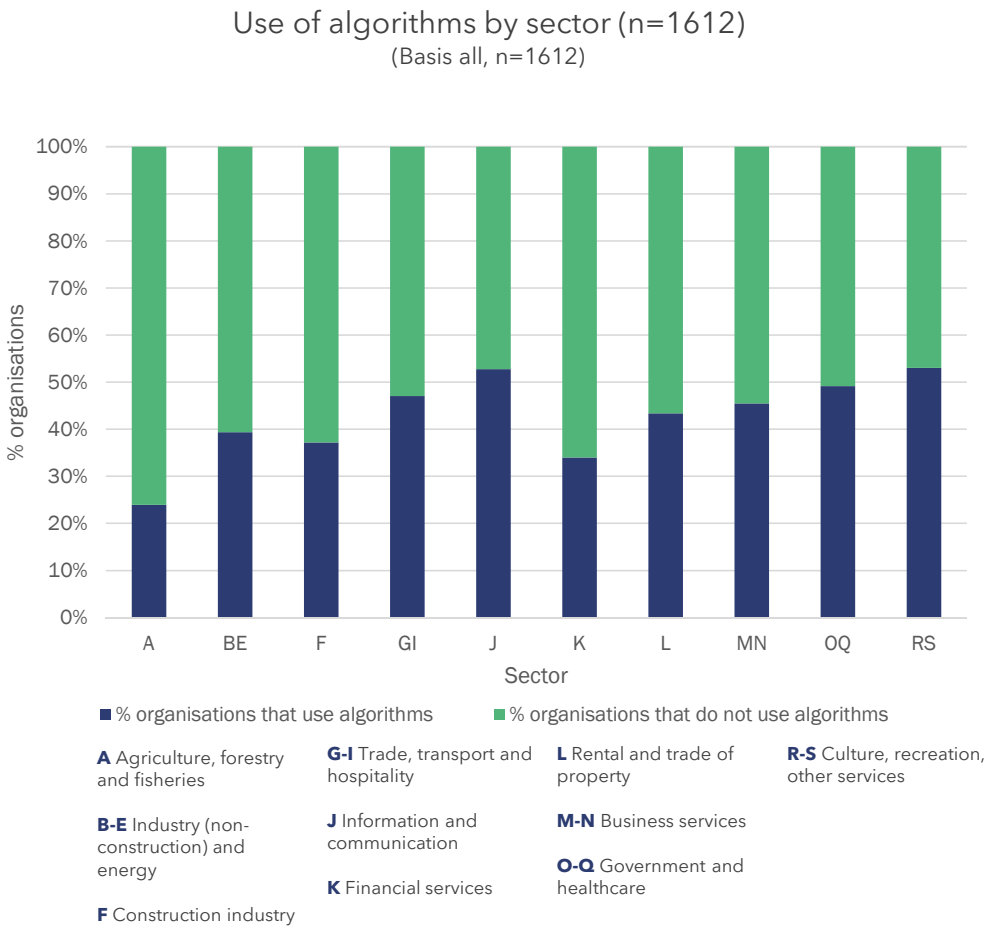
The use of algorithms increases as the number of employees increases



Explanation:

- The graph illustrates that the **use of algorithms increases as the number of employees within an organisation increases**. Of participating organisations that fall under the smaller organisations, approximately 30 to 35% use algorithms, while for larger organisations, this is around 60 to 80%.

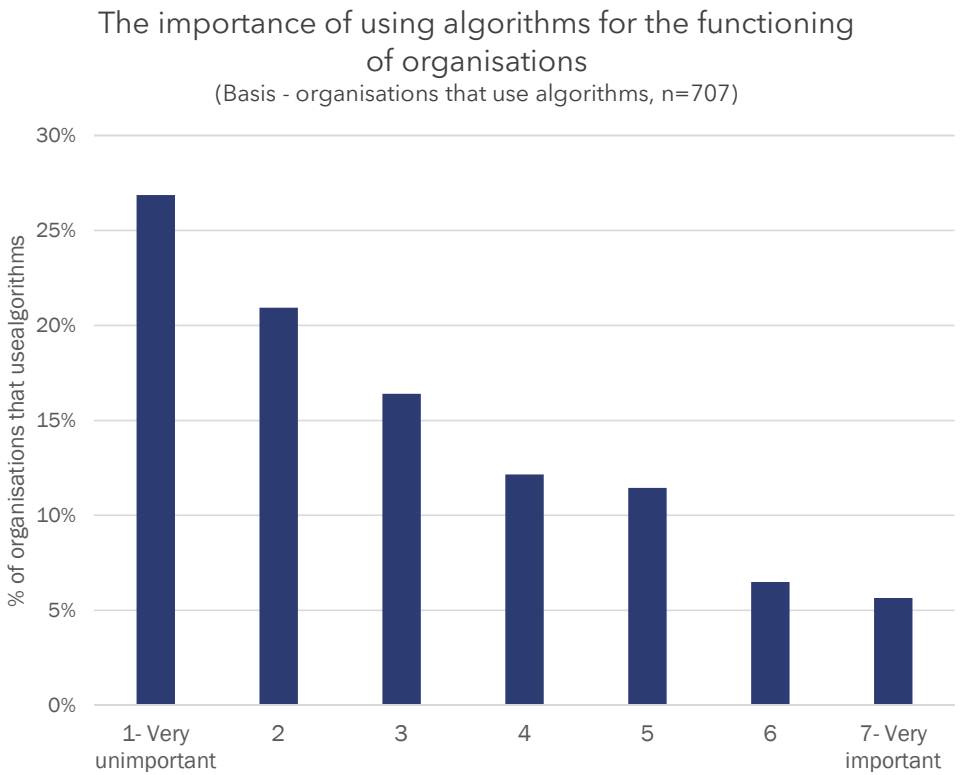
Algorithms are used in every sector



Explanation:

- In every sector, **at least a quarter of organisations use algorithms** that process personal data.
- Although there are no extreme outliers, it is noticeable that algorithms are used by relatively many organisations in the following sectors (approximately 50%):
  - **J Information and communication**
  - **R-S Culture, recreation and other services**
  - **O-Q Government and healthcare**
- In A agriculture, forestry and fisheries, algorithms are used by relatively few organisations (24%).

Many participating organisations do not consider algorithms important for the functioning of the organisations



Explanation:

- The use of algorithms does not seem to be very important for the functioning of the majority of participating organisations. 27% of organisations that use algorithms describe their use as 'very unimportant'.
- Only 6% of organisations that use algorithms rate algorithms as 'very important'.

In large organisations, especially in BE, J and K, the use of algorithms is important for the functioning of the organisations

% of organisations for whom the use of algorithms is important (5, 6, or 7 on a Likert scale)
(basis - organisations that use algorithms, n=707)

Sector	Number of employees: 5 to 19	20 to 49	50 to 99	100 to 499	500 to 1999	2000 or more
A	0%	0%	0%	0%	-	-
BE	20%	0%	17%	23%	8%	69%
F	11%	0%	0%	0%	25%	0%
GI	11%	28%	22%	18%	29%	50%
J	24%	38%	38%	13%	0%	100%
K	30%	20%	0%	56%	56%	82%
L	19%	13%	25%	11%	50%	-
MN	8%	8%	33%	26%	31%	41%
OQ	17%	11%	8%	31%	36%	21%
RS	43%	29%	40%	0%	0%	0%

A Agriculture, forestry and fisheries

B-E Industry (non-construction) and energy

F Construction industry

G-I Trade, transport and hospitality

J Information and communication

K Financial services

L Rental and trade of property

M-N Business services

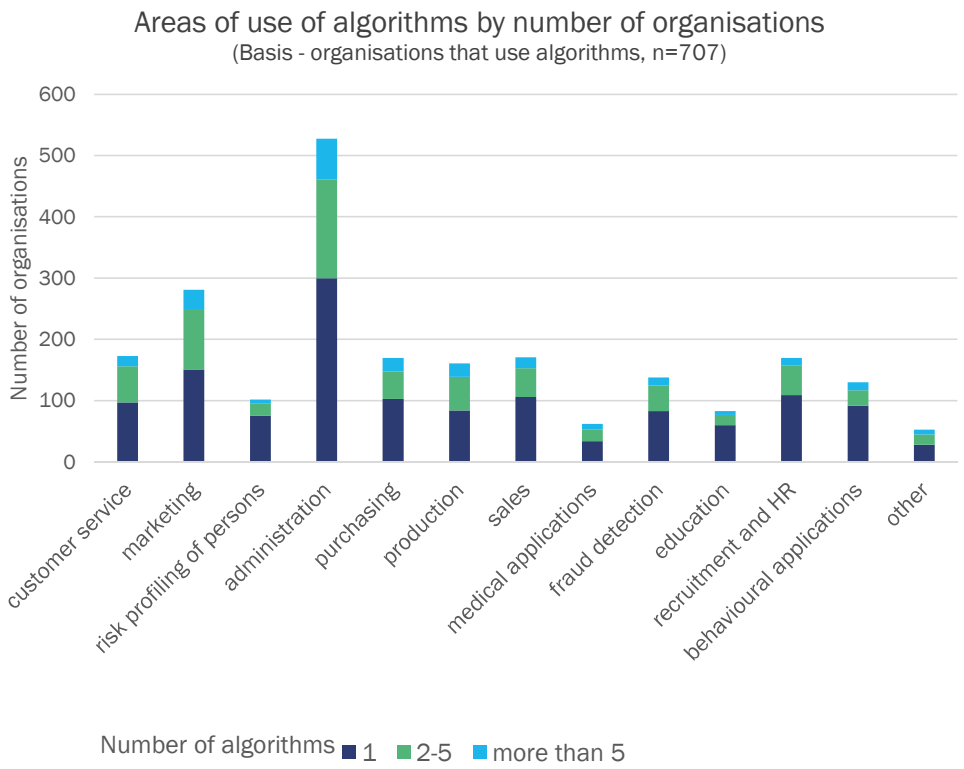
O-Q Government and healthcare

R-S Culture, recreation, other services

Explanation:

- The table on the left presents what percentage of organisations in a certain sector and of a certain size **scored a 5, 6, or 7 on the survey question** 'How important is the use of algorithms in which personal data are processed for the functioning of your organisation?' with a Likert scale of 1-7. The appendix contains the absolute number of organisations using algorithms per category.
- It is striking that for the largest organisations (2000 or more) in sectors B-E Industry and Energy, J Information and Communication and K Financial Services, **the use of algorithms is important for relatively many of them**.
- Furthermore, the use of algorithms is **relatively unimportant** for organisations in sectors A Agriculture, forestry and fisheries and F Construction industry.

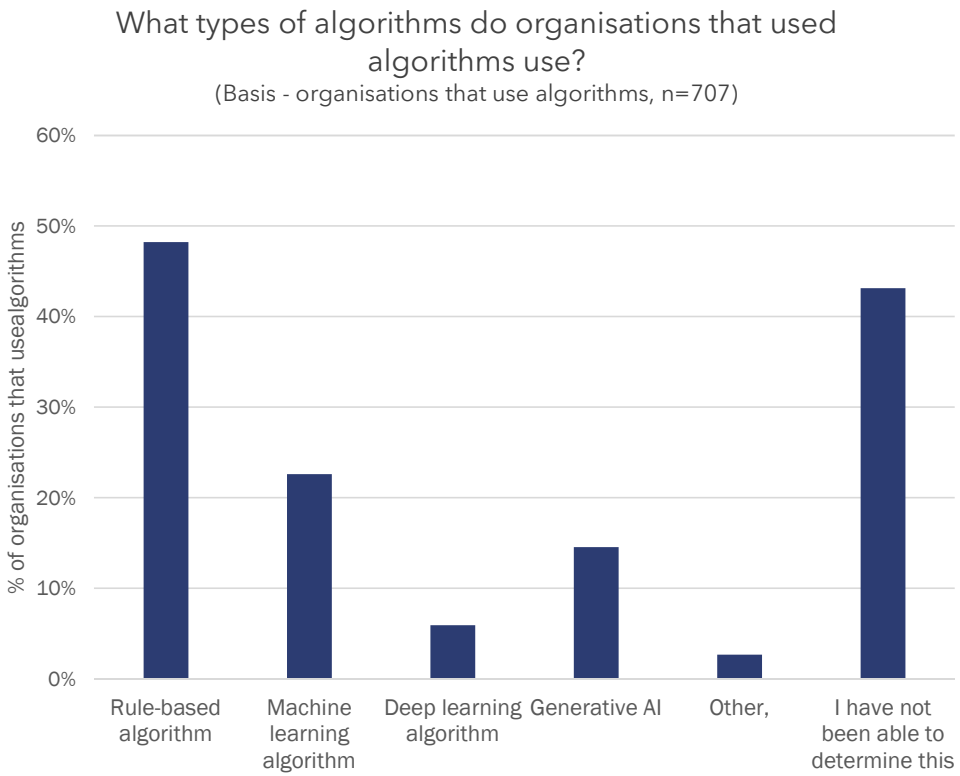
Most algorithms within organisations are used for administrative purposes



Explanation:

- Participating organisations were asked in which areas of use they use algorithms. For more information about the areas of use, see appendix.
- Algorithms are widely used for **administrative purposes.** In addition, many algorithms are also used for **marketing purposes**. See pages 50 to 52 for the specific applications in which algorithms are used.

Many organisations use rule-based algorithms, but determining the type of algorithm used proves difficult



Explanation:

- The graph shows that almost 50% of organisations using algorithms use **rule-based algorithms** .
- It is striking that 43% of organisations **were unable to determine exactly what type of algorithm they are using**. This may indicate a lack of visibility or information about the type of algorithms used within participating organisations.
- Multiple answers were possible in the survey.

4. Maturity measurement

Maturity measurement (1/2)

Introduction

In this chapter we provide insight into how **organisations assess maturity with regard to the following topics**: the responsible use of algorithms, the level of knowledge of legislation and regulations, the process of implementing new algorithms, the awareness of the risks of algorithms and the taking of measures to mitigate these risks. In this chapter, these topics are summarised as: '**governance of algorithms**'. An organisation can have different levels of maturity with regard to governance. These levels are as follows:

Limited	There is no awareness regarding this topic within the organisation
Situational	The organisation devises an approach for each situation
Recorded	The organisation has recorded what it wants to achieve on this subject, how, which resources are available for this and within set deadlines
Monitored	The organisation monitors whether the implementation is in accordance with the established objectives. Results are discussed and form a basis for improvement
Optimised	The organisation strives for optimisation on this topic. There is a continuous feedback loop that leads to continuous improvement of processes

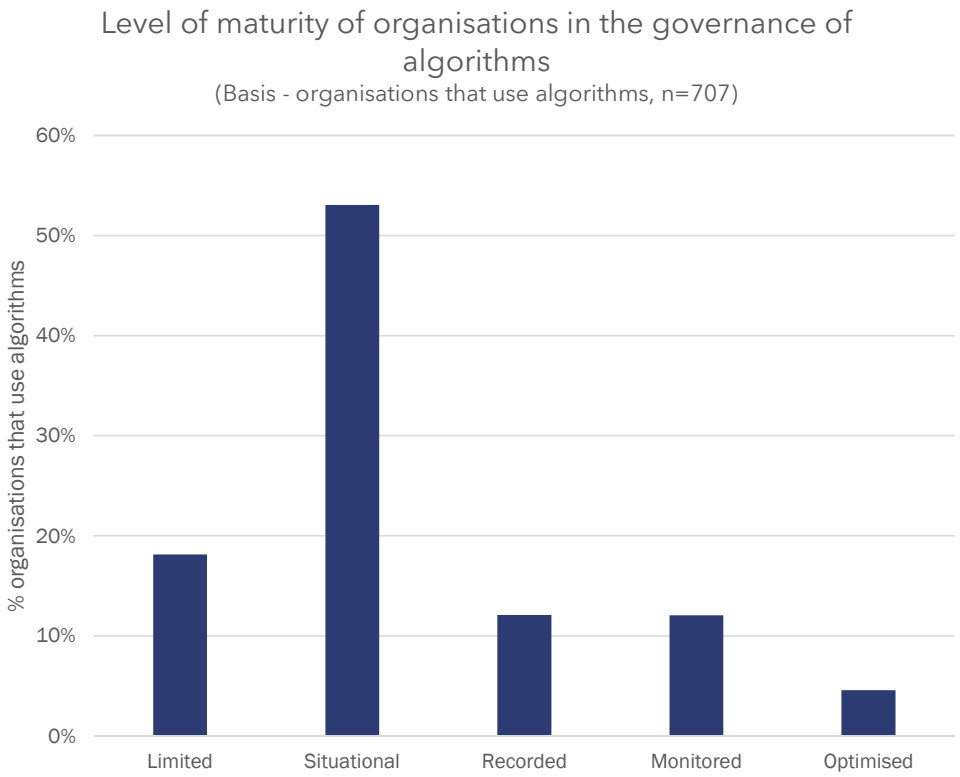
Maturity measurement (2/2)

Key points:

1. **Low level of maturity in algorithm governance.** More than 70% of organisations rate algorithm governance as 'limited' or 'situational'. This means that there is little to no awareness of the subject or that organisations devise an approach for each situation. This points to a lack of robust structures and calls for improvements in knowledge and governance.
2. **Larger organisations typically have more mature governance.** As organisations grow, the maturity of their governance increases. This indicates that larger organisations have greater awareness and governance structures. However, even in large organisations, only 50% have more mature governance than 'situational'. It is also important for large organisations to strengthen governance to ensure responsible use of algorithms.

More than 70% of organisations rate algorithm governance maturity as 'limited' or 'situational' (1/2)

4. Volwassenheidsmeting



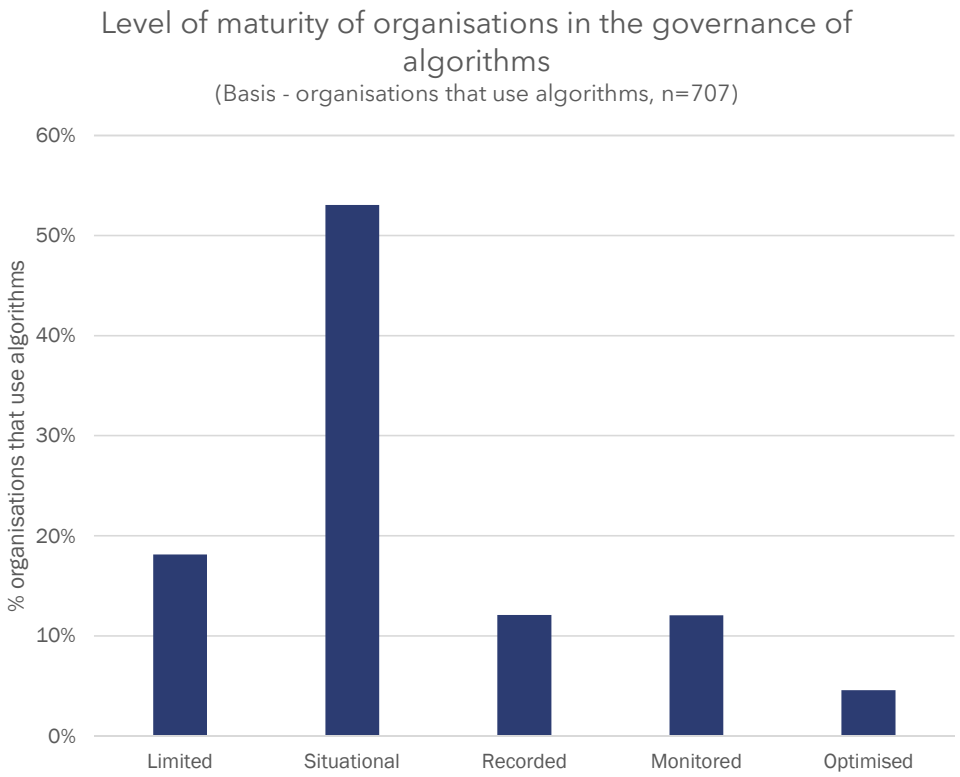
Explanation:

The graph illustrates the summarised result of the maturity measurement with regard to the following 5 themes:

- The responsible use of algorithms;
- The level of knowledge about laws and regulations in the field of algorithms is processed;
- The process of implementing new algorithms;
- The awareness of organisations about the risks that the use of algorithms entails for certain (groups of) individuals;
- The internal process of taking measures to mitigate these risks.

More than 70% of organisations rate algorithm governance maturity as 'limited' or 'situational' (2/2)

4. Volwassenheidsmeting

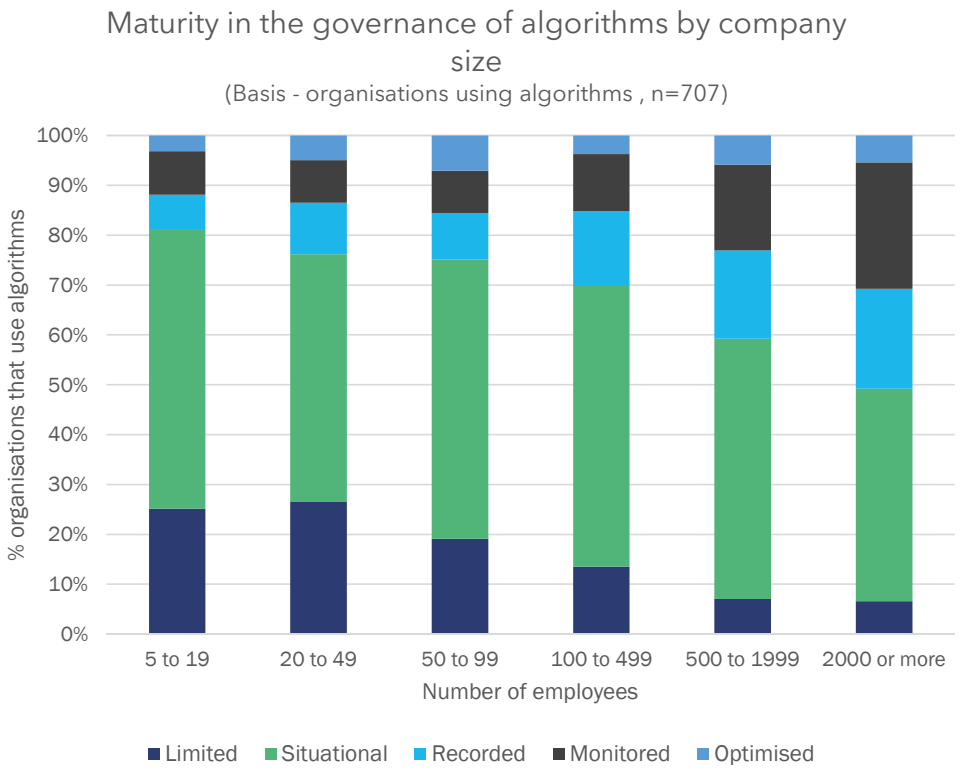


Explanation:

- Organisations rate the level of maturity with regard to **governance of algorithms as relatively low**.
- More than **50% of organisations** indicate that the level of maturity in algorithm governance is **'situational'** , meaning that the organisation devises an approach for each situation.
- **18% of organisations** even indicate that the level of maturity of the organisation is **'limited'** , meaning that there is no awareness regarding algorithm governance within the organisation.

The level of maturity of algorithm governance design increases as organisations have more employees

4. Volwassenheidsmeting



Explanation:

- The level of maturity of **algorithm governance increases as organisations have more employees**. Yet only 50% of organisations with more than 2,000 employees have a governance level that is **'recorded'** or higher.

5. Monitoring the risks of algorithms

Monitoring the risks of algorithms

5. Toezicht op risico's van algoritmes

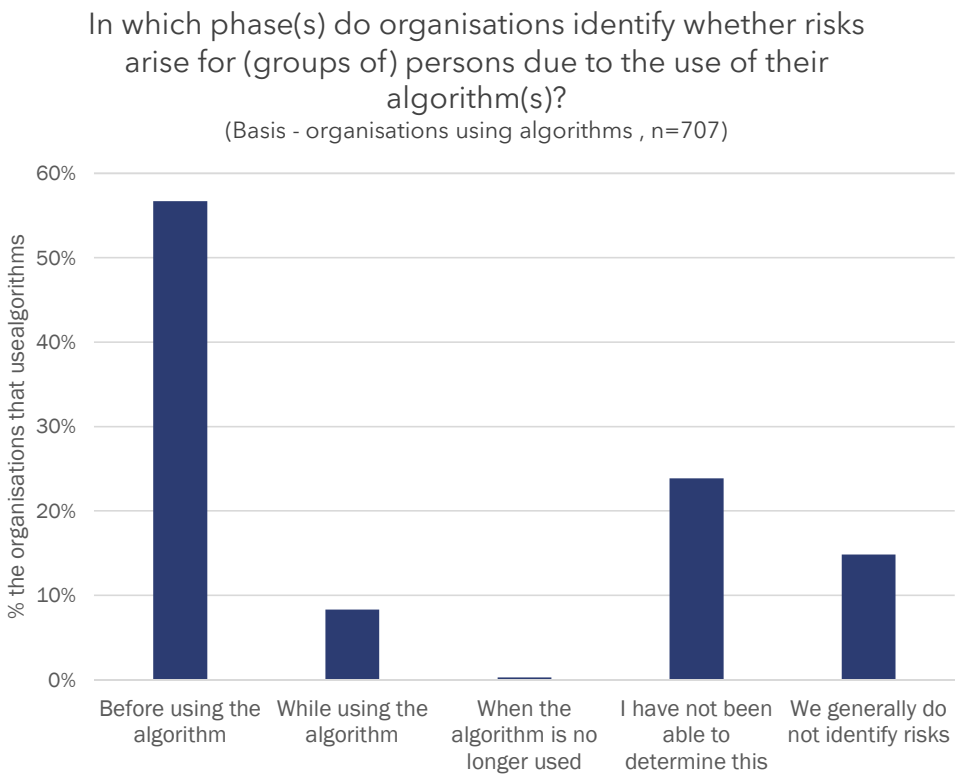
Introduction

This chapter provides insight into how organisations deal with potential risks resulting from the use of algorithms. We analyse whether and when organisations identify risks and which tools they use for this. Furthermore, this chapter discusses the extent to which organisations take risk-mitigating measures and whether organisations have set up internal monitoring of algorithms.

Key points:

1. **Risk management is not yet standard practice.** The study indicates that risk analysis, algorithm monitoring, and risk mitigation measures are not yet standard practice in about half of organisations. Organisations that do identify risks most often cite privacy breaches, data breaches, and incorrect or irrelevant output as risks.
2. **Smaller organisations lack supervision and risk mitigation.** More than half of the organisations have appointed one or more supervisory persons. However, smaller organisations often do not have a supervisor and many organisations never or hardly ever take risk-mitigating measures.

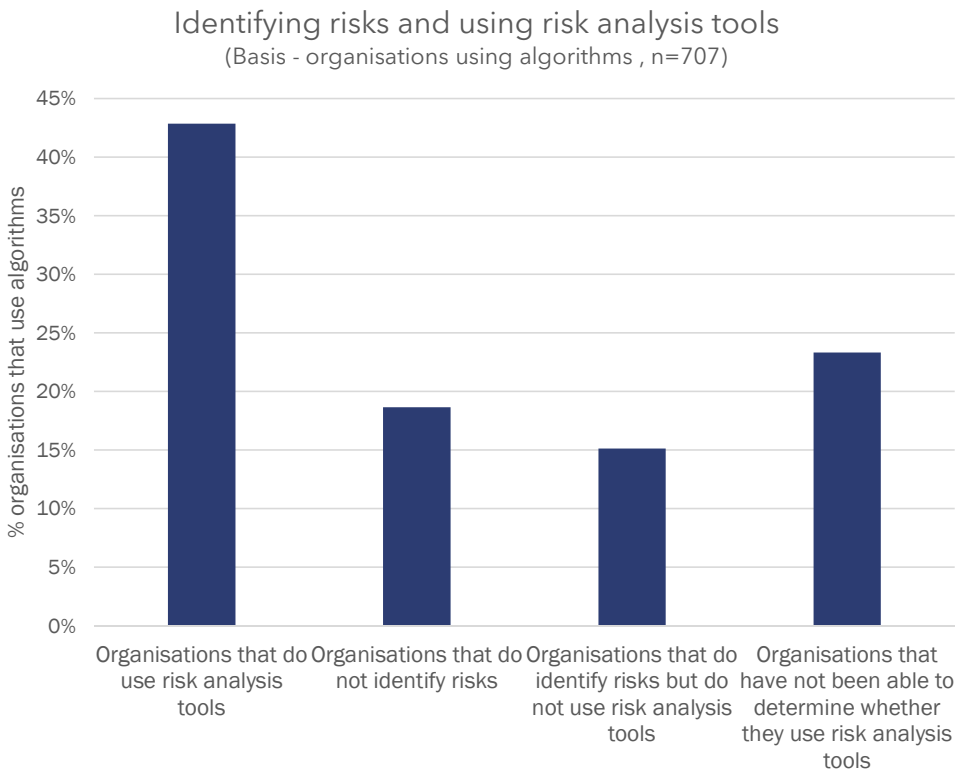
More than half of organisations identify risks before using algorithms



Explanation:

- 57% of organisations indicate that they assess risks to individuals from using an algorithm **prior to using** it. This shows that **more than half of organisations** try to prevent risks before they occur.
- Once the algorithm is in use, it is noticeable that **only 8% of organisations monitor** whether risks arise during use. This means that 92% of organisations do not conduct further monitoring of their algorithms after deployment, which is worrying.

43% of organisations use risk analysis tools to identify risks

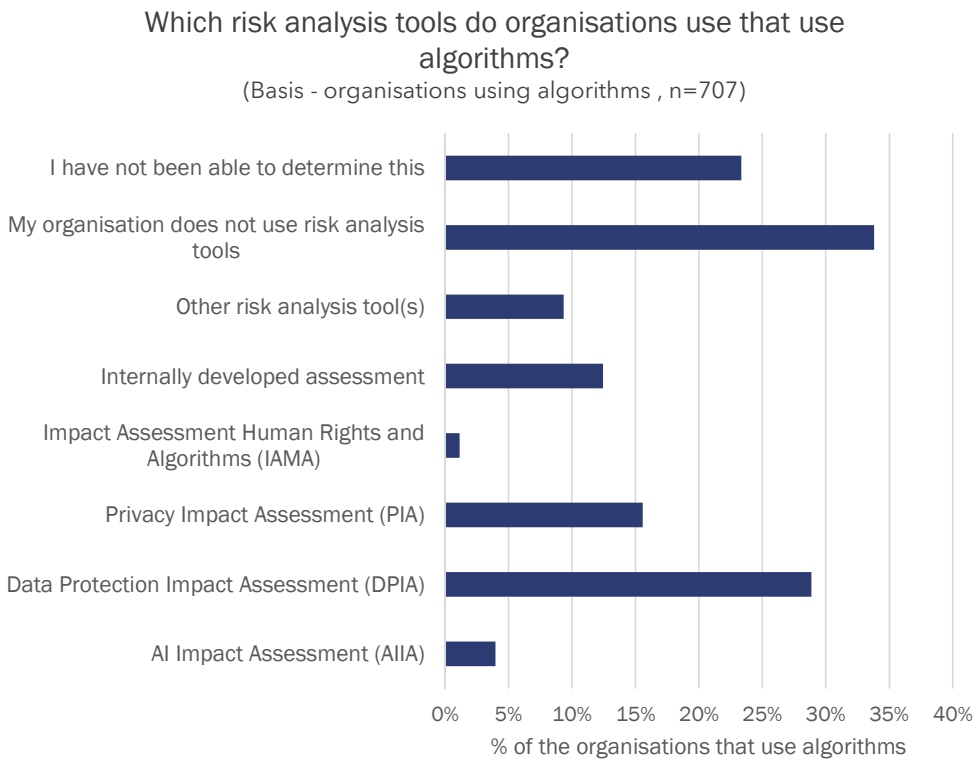


Explanation:

- Approximately 43% of organisations indicate that they use risk analysis tools to identify risks.
- It is striking that almost 34% of organisations indicate that they **do not identify risks or do not use risk analysis tools**, even though they use algorithms.
- In addition, almost a quarter of organisations indicate that they **cannot determine whether risk analysis tools are used**. This may indicate a lack of internal policies, procedures and/or communication about this.

Most organisations do not use risk analysis tools

5. Toezicht op risico's van algoritmes



Explanation:

- 34% of organisations **indicate <u>not to</u> use risk analysis tools**. In addition, almost a quarter of organisations indicate that they cannot determine which risk analysis tools are used.
- Although not every algorithm requires a risk analysis (depending on the risk level), such tools are used relatively little. This may indicate that few risky algorithms are used, but also that many Dutch organisations do not have clear governance surrounding the use of algorithms.
- Data Protection Impact Assessments (DPIAs) are **the most common risk analysis tool** used by organisation (29%). After that, the Privacy Impact Assessment (PIA) (16%) or an internally developed assessment (13%) are used most often.

Smaller organisations and organisations in agriculture, forestry and fisheries never or hardly ever risk-mitigating measures

% Organisations that never or hardly ever take risk-mitigating measures
(basis - organisations that use algorithms, n=707)

Sector	Number of employees: 5 to 19	20 to 49	50 to 99	100 to 499	500 to 1999	2000 or more
A	88%	86%	100%	0%	-	-
BE	50%	58%	67%	36%	8%	15%
F	56%	40%	44%	22%	0%	50%
GI	52%	67%	50%	45%	6%	6%
J	41%	0%	0%	25%	0%	0%
K	40%	80%	33%	11%	0%	0%
L	44%	63%	50%	22%	0%	-
MN	48%	38%	27%	30%	15%	0%
OQ	54%	42%	42%	54%	7%	14%
RS	67%	57%	40%	38%	0%	0%

A Agriculture, forestry and fisheries

B-E Industry (non-construction) and energy

F Construction industry

G-I Trade, transport and hospitality

J Information and communication

K Financial services

L Rental and trade of property

M-N Business services

O-Q Government and healthcare

R-S Culture, recreation, other services

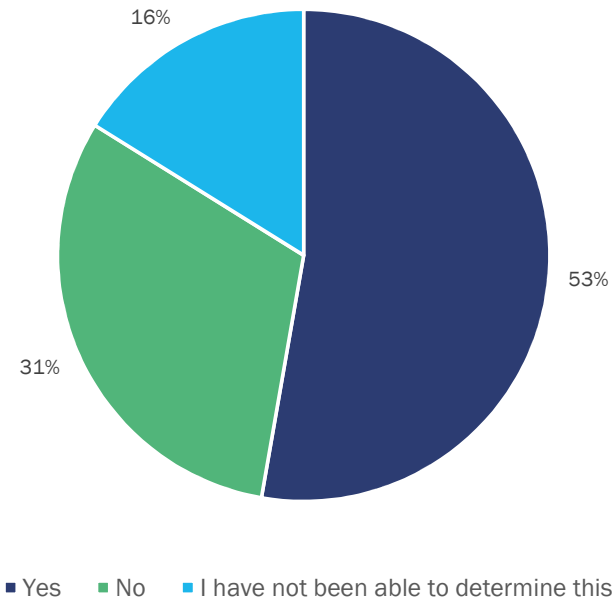
Explanation:

- The table on the left shows the percentage of organisations in a specific sector and with a specific company size that indicated that they **never** or **hardly ever** take technical and organisational measures that mitigate the risks of algorithms.
- In particular, many smaller organisations with up to 99 employees **never** or **hardly ever** take risk-mitigating measures.
- Organisations in sector A Agriculture, forestry and fisheries often indicate that they **never** or **hardly ever** take risk mitigating measures. In sector J Information and Communication, risk-mitigating measures are taken relatively often.

More than half of the organisations that use algorithms have appointed an internal superviso

5. Toezicht op risico's van algoritmes

Is there someone within organisations who monitors the use of algorithms in which personal data are processed?
(Basis - organisations that use algorithms, n=707)



Explanation:

- 53% of organisations that use algorithms have someone appointed to oversee their use.
- The other organisations **do not have an internal supervisor or have not been able to determine this**. This may indicate a lack of supervisory structure in a large proportion of organisations.

Smaller organisations often do not have an internal supervisor

% of organisations that have appointed an internal supervisor
(basis - organisations that use algorithms, n=707)

Sector	Number of employees: 5 to 19	20 to 49	50 to 99	100 to 499	500 to 1999	2000 or more
A	25%	43%	0%	100%	-	-
BE	30%	17%	33%	55%	54%	69%
F	33%	40%	22%	44%	75%	100%
GI	41%	33%	33%	45%	65%	81%
J	59%	75%	100%	75%	83%	67%
K	70%	60%	83%	67%	78%	82%
L	50%	38%	13%	56%	50%	-
MN	28%	69%	53%	70%	77%	91%
OQ	35%	37%	58%	46%	71%	50%
RS	43%	43%	40%	50%	100%	100%

A Agriculture, forestry and fisheries

B-E Industry (non-construction) and energy

F Construction industry

G-I Trade, transport and hospitality

J Information and communication

K Financial services

L Rental and trade of property

M-N Business services

O-Q Government and healthcare

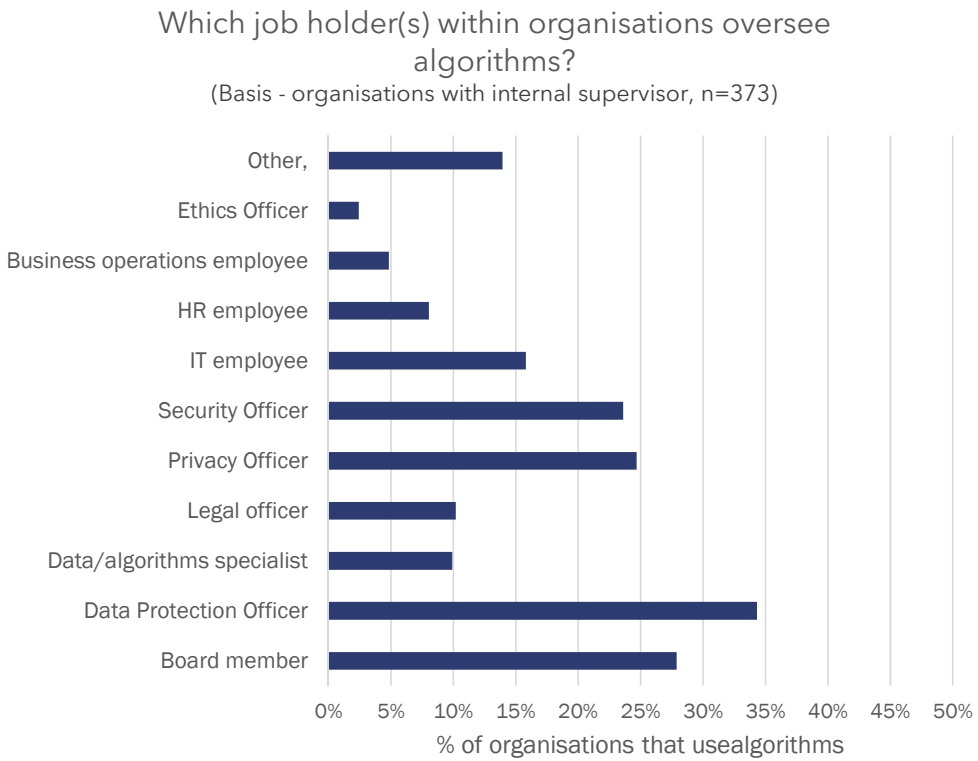
R-S Culture, recreation, other services

Explanation:

- The table on the left shows the percentage of organisations in a specific sector and company size that indicated they had appointed one or more people to monitor algorithms.
- We see that in sector J information and communication and in sector K financial services, relatively **many organisations have appointed an internal supervisor**.
- In sector B-E Industry and energy, sector L Rental and trade of property and sector O-Q Government and healthcare, **relatively few organisations have appointed an internal supervisor.**

Privacy and information security supervisory authorities often take on the monitoring of algorithms

5. Toezicht op risico's van algoritmes



Explanation:

- Internal algorithm supervisors are often persons who have one of the supervisory functions for privacy and information security within an organisation: the Data Protection Officer (DPO) (35%), Privacy Officer (25%) or the Security Officer (25%).
- It is also striking that relatively often, a board member monitors algorithms, namely in 28% of organisations. This may possibly be explained by the size of the organisation; in a small organisation, it is usually more common for a board member to be charged with supervision.

6. The most impactful algorithm

The most impactful algorithm of organisations

While the questions in previous chapters covered all algorithms an organisation uses, this chapter focuses specifically on the algorithm that has the most significant impact on individuals, about which the participating organisations answered a number of questions. This chapter highlights the following topics:

6.1 Purpose, development and use of the algorithm with the greatest impact on individuals

6.2 Risks of the algorithm with the greatest impact on individuals

6.3 The use of the algorithm for making decisions about individuals

6.1 Purpose, development and use of the algorithm

Purpose, development and use of the algorithm

6. Meest impactvolle algoritme

Introduction

In this section, we present for which purposes organisations use the most impactful algorithm, to what extent special categories of personal data are used and how the algorithms used were developed or purchased.

Key points:

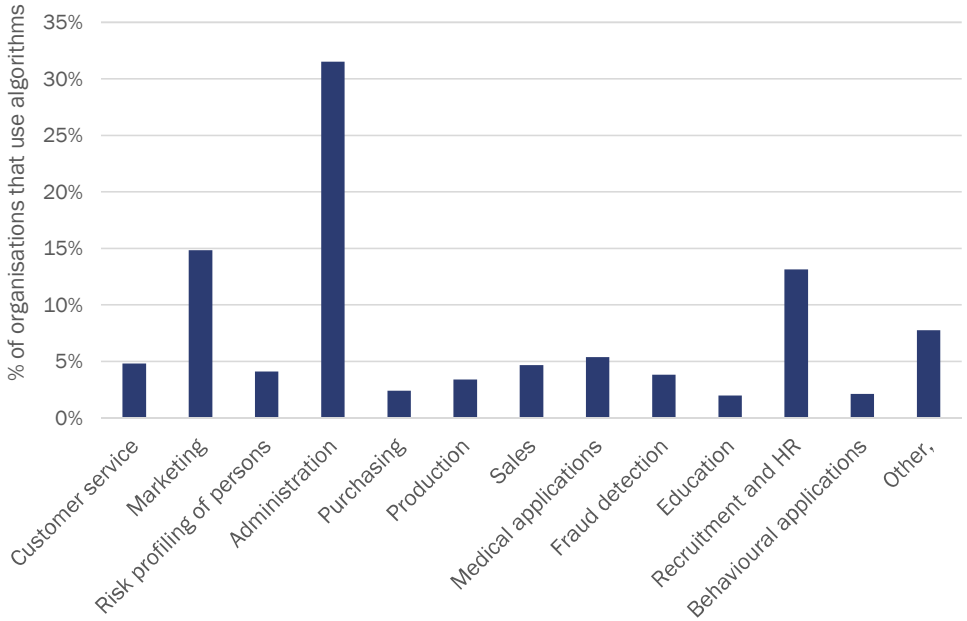
1. **Algorithms are most commonly used for invoice automation.** The most impactful algorithms are used for administrative purposes, mainly for invoice automation.
2. **11% of organisations use special personal data in their most impactful algorithm.** Especially in medical applications, special categories of personal data are - often logically - used (health data). Their use requires extra attention to the protection and responsible use of these data.
3. **High dependency on third parties requires attention.** In 65% of organisations, the algorithm with the greatest impact was developed by a third party. This dependency raises important questions about accountability, data security, and transparency, especially since many organisations do not fully understand the type of algorithm they are using.

By far the most algorithms with the greatest impact on individuals are used for administrative purposes (1/2)

6. Meest impactvolle algoritme

Which category does the algorithm with the most significant impact on individuals within organisations fall into?[1]

(Basis - organisations that use algorithms, n=707)

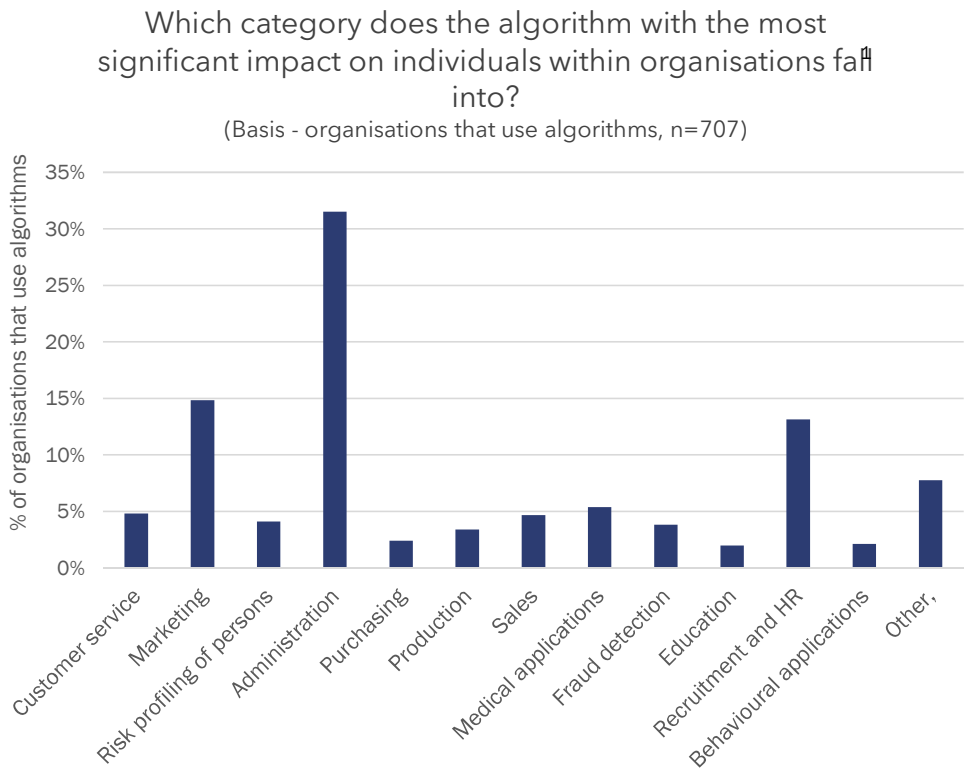


Explanation:

- It is striking that the majority of organisations indicated that their most impactful algorithms are used within **administrative processes** (32%).[1]
- In addition, **marketing** (15%) and **recruitment and HR** (14%) are also common categories.
- Other categories, such as **customer service** (5%), **sales** (5%), **medical applications** (6%), and **fraud detection** (4%), show that algorithms are also used in these areas, but at a relatively lower frequency compared to the previously mentioned categories.

[1] It is important to note that sometimes, this is also the only algorithm an organisation uses.

By far the most algorithms with the greatest impact on individuals are used for administrative purposes (1/2)



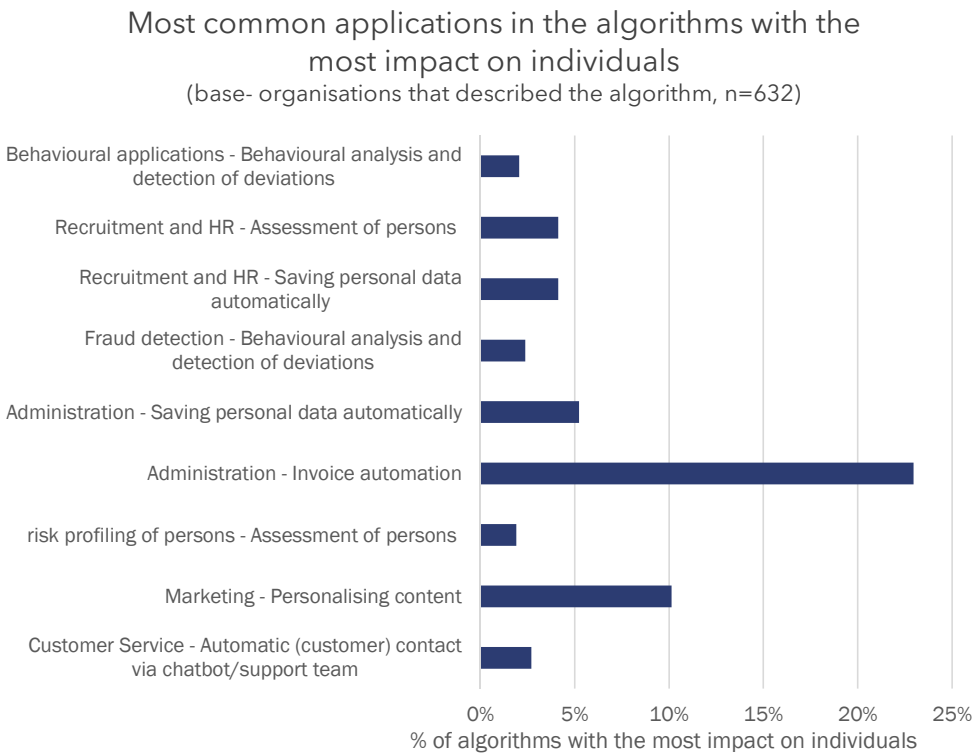
Explanation:

Categories such as **risk profiling people** (4%), **production** (4%), and **behavioural applications** (2%) also have limited frequency, while **education** (2%) and **purchasing** (3%) show the lowest percentages.

[1] It is important to note that sometimes, this is also the only algorithm an organisation uses.

By far the most algorithms with the greatest impact on individuals are used for automating invoices within administration

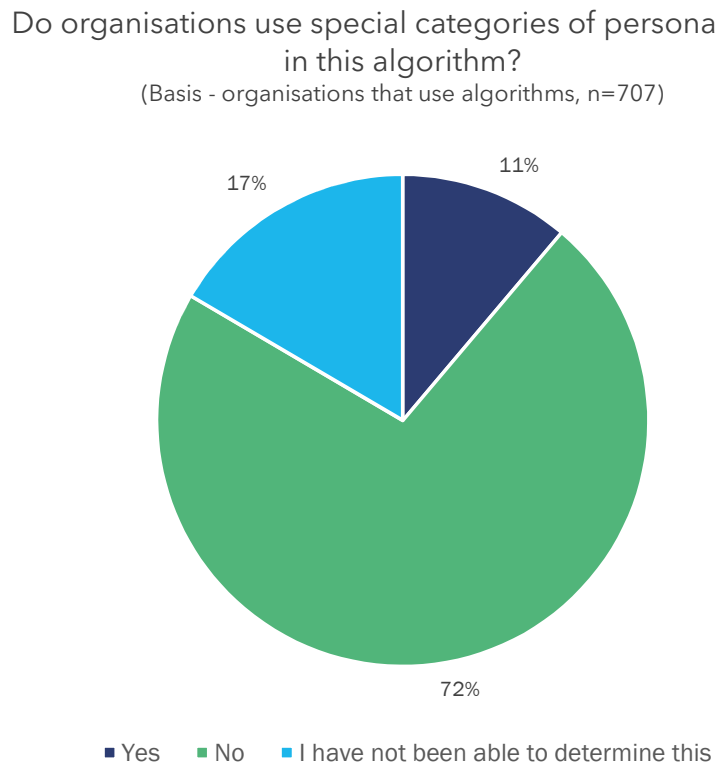
6. Meest impactvolle algoritme



Explanation:

- The graph shows that **the invoice automation** is most often mentioned as an application of an algorithm with the most significant impact on individuals (23%). Algorithms that automatically recognise and process incoming invoices are an example of this.
- **Personalising content** is mentioned by 10% as the most common application of algorithms in marketing.
- Thirdly, the **automatic storage of personal data** is mentioned as the most common application of algorithms (5%).
- It is striking that two of the most frequently mentioned applications occur within the administration category.

11% of organisations process special categories of personal data in this algorithm

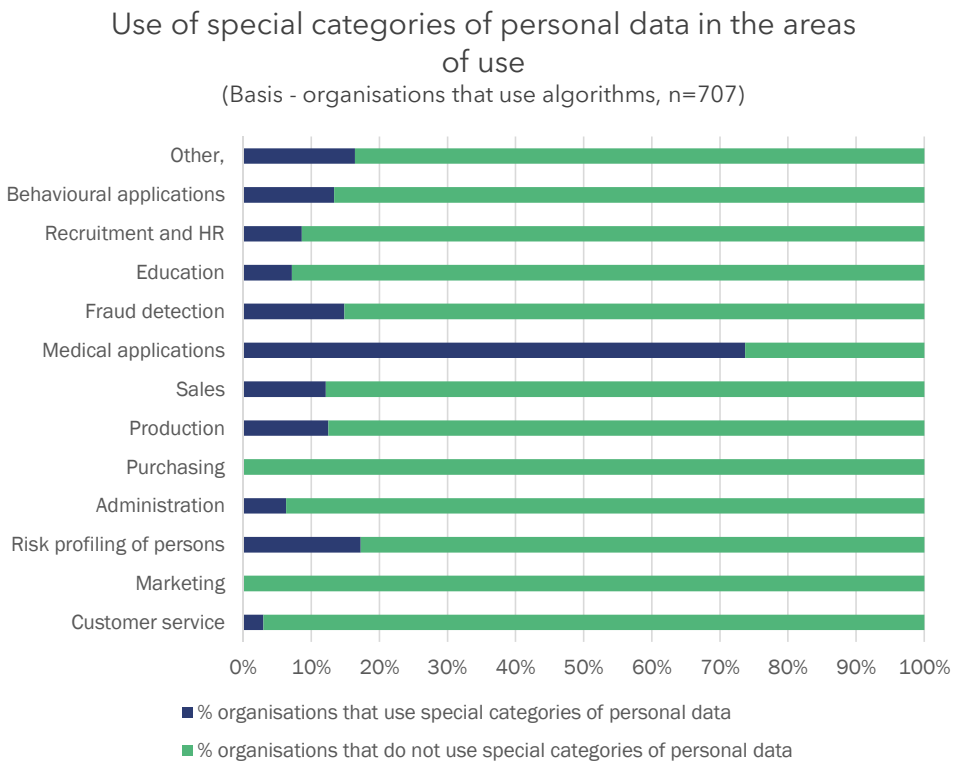


Explanation:

- 72% of organisations do not use **special categories of personal data** when using algorithms. This gives the impression that organisations are generally cautious about processing this type of data, such as race, religion or health information.
- Although it is a small percentage, the graph indicates that 11% of organisations **do use special categories of personal data** in their algorithms.
- Approximately 17% of organisations indicate that they are **unable to determine whether their algorithms process special categories of personal data.** This points to a potential lack of insight or control over their algorithms, which could expose organisations to both legal and ethical risks.

Special **categories of** personal data are mainly used in medical applications

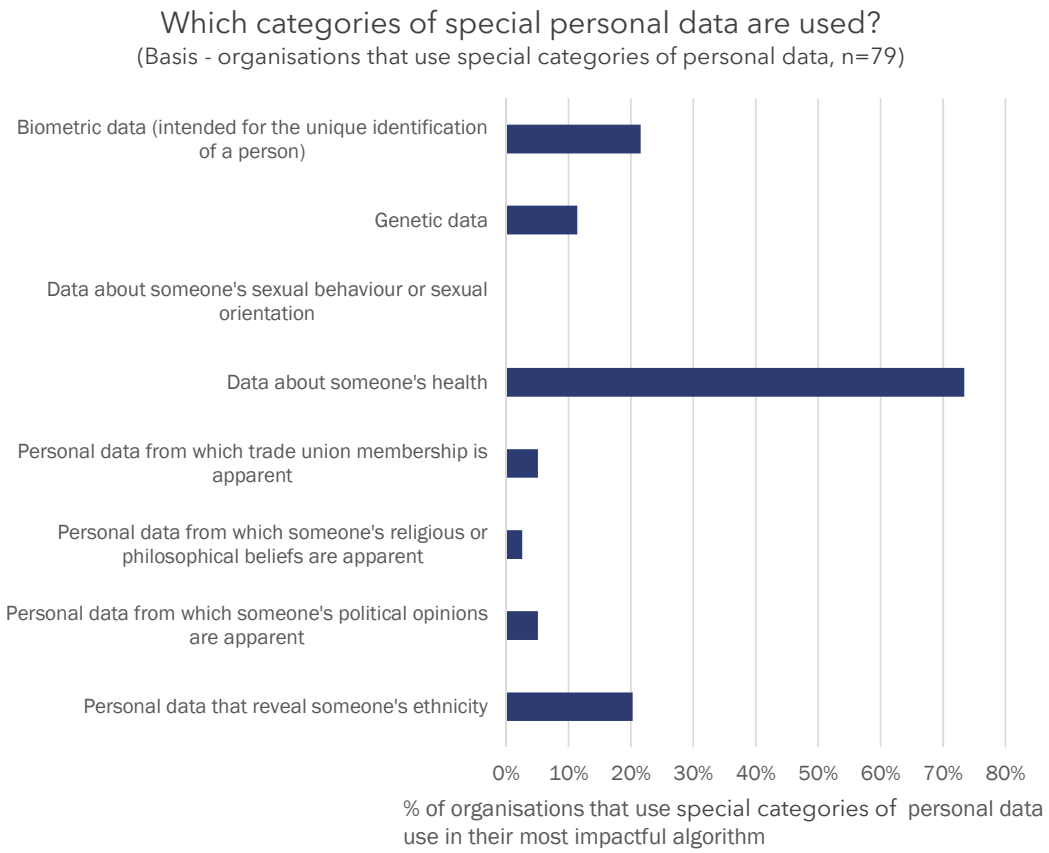
6. Meest impactvolle algoritme



Explanation:

- 74% of organisations that use algorithms for **medical applications use special categories of personal data**.
- This can be explained by the fact that health data is classified as a category of special personal data and is (logically) often used in medical algorithms.

Health data are the most commonly used special category of personal data

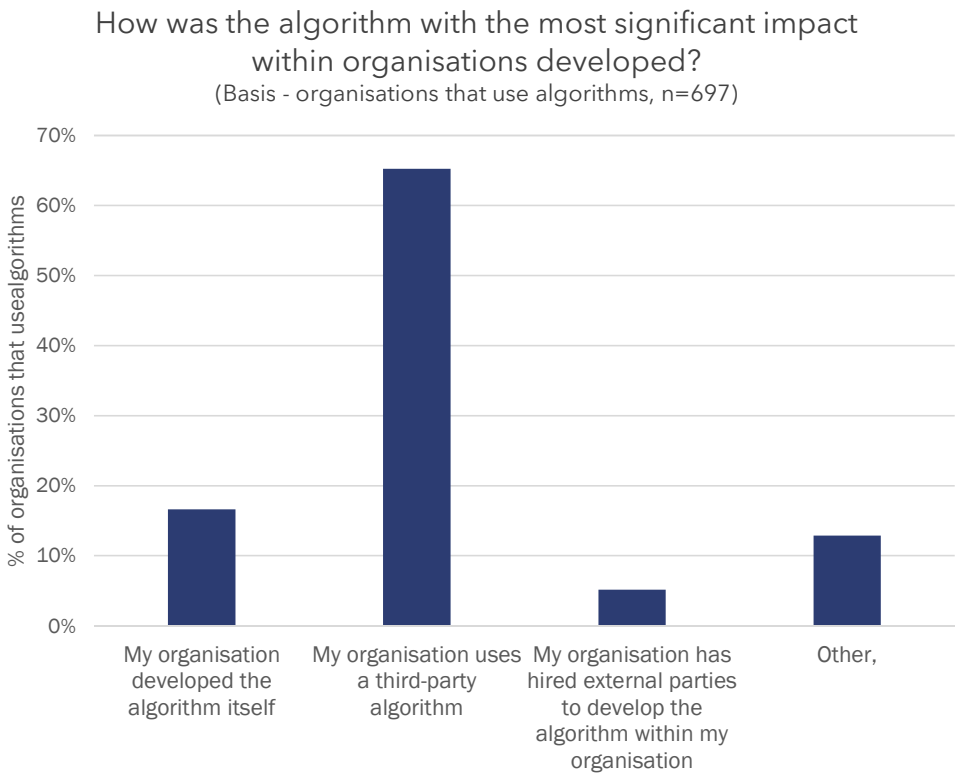


Explanation:

- 73% of organisations that use special categories of personal data in algorithms use **data about a person's health.** The use of health data requires careful protection.
- 22% of organisations that use special categories of personal data use **biometric data and/or applications**, such as facial recognition, fingerprints and voice recognition. Under the AI Act, biometrics is placed in the high-risk category.
- 20% of organisations that use special categories of personal data use **personal data that reveals a person's ethnicity**. Organisations must have a legal basis for this.
- Organisations were permitted to provide multiple answers.

For many organisations (65%), the algorithm with the most significant impact was developed by third parties

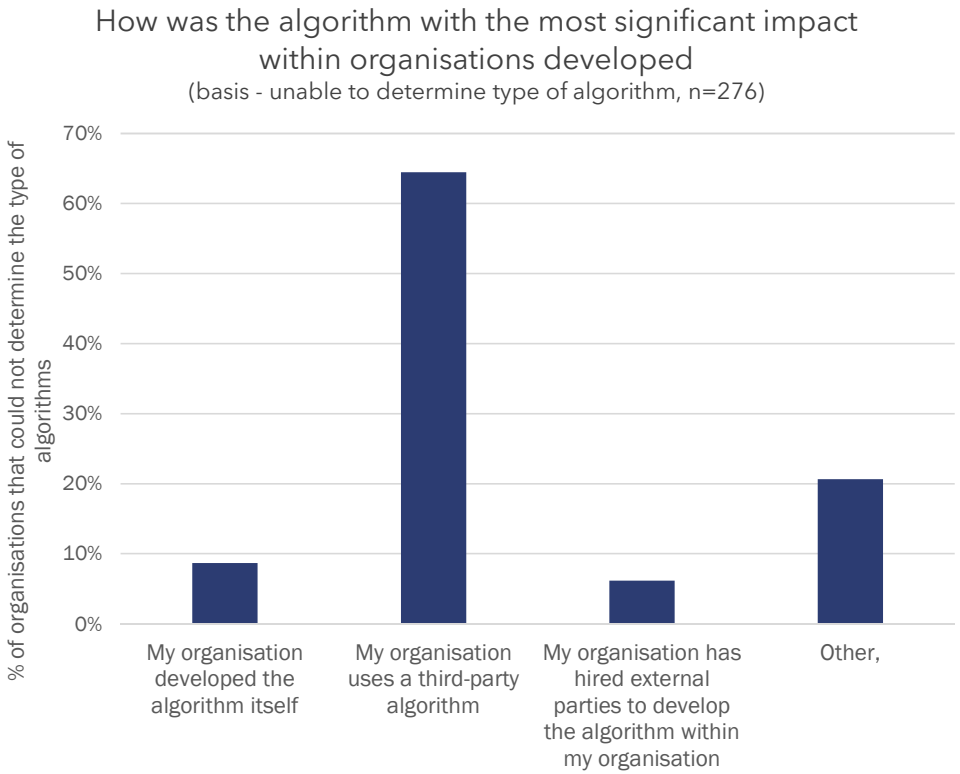
6. Meest impactvolle algoritme



Explanation:

- The algorithm with the greatest impact on individuals within organisations is often **developed by third parties**.
- This raises **questions about responsibility for these algorithms**, data security and transparency about the operation of externally developed algorithms.
- Motivations for organisations to choose algorithms from external suppliers may include that they are usually thoroughly tested and optimised, which improves the quality of the algorithm. In addition, using existing solutions saves time and no specialist knowledge is required within the organisation.
- Using an algorithm developed by a third party also comes with risks. These are discussed on the next page.

Many organisations that do not know what type of algorithms they are using use the algorithm with the most significant impact from a third party



Explanation:

- This graph illustrates a **risk of using third-party algorithms**. The graph shows that organisations that cannot determine what type of algorithms they are using often purchase them from a third party.
- This raises questions about the level of **transparency** about the algorithm, the **knowledge** about the algorithm within the organisation and the **control** over the operation and output of the algorithm.
- The fact that organisations often do not know what type of algorithm they are using indicates a **lack of insight and control**. This suggests that the third party may not always provide sufficient information about the operation, underlying assumptions or risks of the algorithm.

Large organisations in sectors J and K most often develop their most impactful algorithm themselves

6. Meest impactvolle algoritme

% of organisations that developed the most impactful algorithm themselves
(basis - organisations that use algorithms, n=707)

	5 to 19	20 to 49	50 to 99	100 to 499	500 to 1999	2000 or more
A	0%	0%	0%	50%	-	-
BE	40%	8%	17%	23%	8%	15%
F	0%	20%	11%	0%	0%	0%
GI	11%	6%	6%	12%	24%	31%
J	18%	31%	25%	13%	50%	67%
K	30%	20%	0%	33%	33%	64%
L	6%	0%	0%	22%	0%	-
MN	8%	8%	20%	17%	15%	36%
OQ	4%	5%	25%	31%	7%	14%
RS	24%	43%	0%	0%	0%	0%

A Agriculture, forestry and fisheries

B-E Industry (non-construction) and energy

F Construction industry

G-I Trade, transport and hospitality

J Information and communication

K Financial services

L Rental and trade of property

M-N Business services

O-Q Government and healthcare

R-S Culture, recreation, other services

Explanation:

- Especially large organisations with more than 2,000 employees in sectors J Information and Communication and K Financial Services have **often themselves developed** the algorithm with the greatest impact on individuals.
- In sectors A Agriculture, forestry and fisheries, F Construction and L Rental and trade of property, **relatively few organisations have developed their most impactful algorithm themselves**.
- Furthermore, there is **no clear trend to be discovered** in the size of organisations and the self-development of algorithms. Both smaller and larger organisations regularly develop their own algorithms, but more often purchase the algorithm from third parties.

6.2 Risks of the most impactful algorithm

Risks of the most impactful algorithm

6. Meest impactvolle algoritme

Introduction

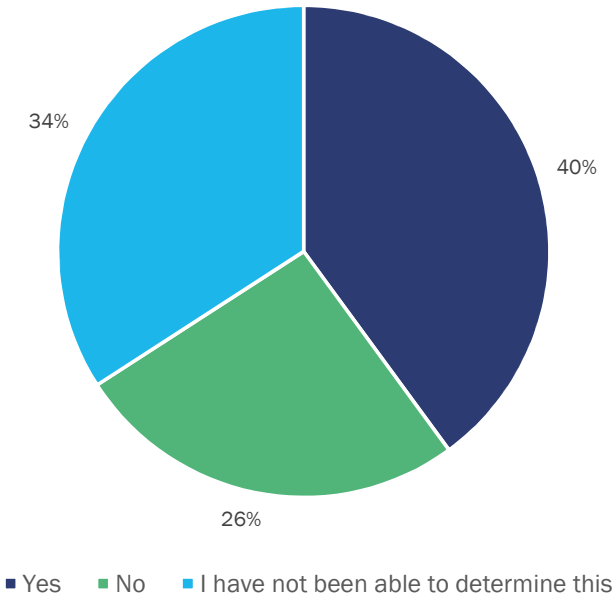
In this section we consider how to deal with the risks of the algorithms that have the greatest impact on individuals. We provide insight into the extent to which organisations assess whether the use of their most impactful algorithm entails risks, whether they use risk analysis tools and which risks they identify.

Key points:

1. **Lack of awareness about the risks of algorithms.** Less than half of Dutch organisations have actively assessed whether the most impactful algorithm entails risks. Especially in organisations with fewer than 500 employees, risk identification is often lacking. This raises the question of whether risks to individuals remain undetected and lead to hazards. Organisations that identified risks most often identified *privacy breaches and data breaches* and *incorrect or irrelevant output*.
2. **The use of risk assessment tools is limited.** Of the organisations that have assessed whether the use of the algorithm with the greatest impact on individuals poses risks, 33% do not use risk assessment tools for this or were unable to determine this. When organisations do use risk analysis tools, DPIAs and PIAs are the most commonly used.

Less than half of Dutch organisations have consciously assessed whether the algorithm entails risks

Has your organisation assessed whether using this algorithm entails risks?
(Basis - organisations that use algorithms, n=707)



Explanation:

- More than a quarter of organisations using algorithms have **not conducted a risk assessment for their most impactful algorithm**, which may indicate a lack of awareness or prioritisation of the potential negative impacts of algorithms.
- 34% of organisations using algorithms indicate that they **do not know whether they have performed a risk assessment for the algorithm**, which may indicate a lack of transparency, internal communication, or clear structure around assessing risks.
- About 40% of organisations have conducted a risk assessment. The graph shows a **relatively large gap** in awareness and responsibility surrounding the risks of using the most impactful algorithm.

In particular, organisations with fewer than 500 employees often have not identified whether the algorithm with the greatest impact entails risks

6. Meest impactvolle algoritme

% Organisations that have not identified risks for the most impactful algorithm
(basis - organisations that use algorithms, n=707)

Sector	Number of employees: 5 to 19	20 to 49	50 to 99	100 to 499	500 to 1999	2000 or more
A	25%	43%	100%	50%	-	-
BE	60%	17%	25%	14%	15%	8%
F	44%	60%	11%	11%	25%	0%
GI	48%	44%	22%	36%	6%	0%
J	41%	25%	13%	38%	17%	0%
K	20%	20%	17%	33%	0%	0%
L	19%	38%	25%	22%	0%	-
MN	24%	31%	20%	4%	8%	9%
OQ	28%	37%	17%	31%	7%	21%
RS	48%	29%	40%	13%	0%	0%

A Agriculture, forestry and fisheries

B-E Industry (non-construction) and energy

F Construction industry

G-I Trade, transport and hospitality

J Information and communication

K Financial services

L Rental and trade of property

M-N Business services

O-Q Government and healthcare

R-S Culture, recreation, other services

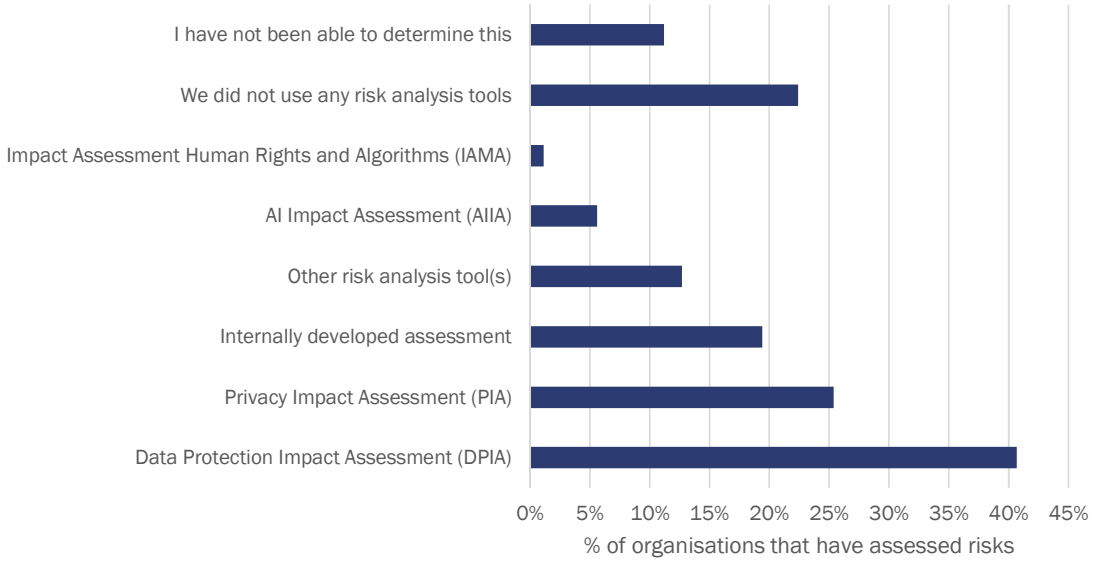
Explanation:

- The table on the left shows the percentage of organisations in a specific industry and of a specific company size that **did not** identify whether the algorithm with the greatest impact on individuals poses risks to individuals.
- **The size of organisations in particular seems to determine whether or not risks are identified**. It is striking that smaller organisations in particular often have not identified any risks. Organisations with more than 500 employees clearly indicate that they do not identify any risks.
- Organisations in the Financial Services sector indicate relatively few times that they do not identify any risks.

The most commonly used risk analysis tools for algorithms with the greatest impact on individuals are DPIAs and PIAs

6. Meest impactvolle algoritme

Which risk analysis tools have organisations used for the algorithm with the most impact on individuals?
(basis, organisations that have assessed risks, n=268)

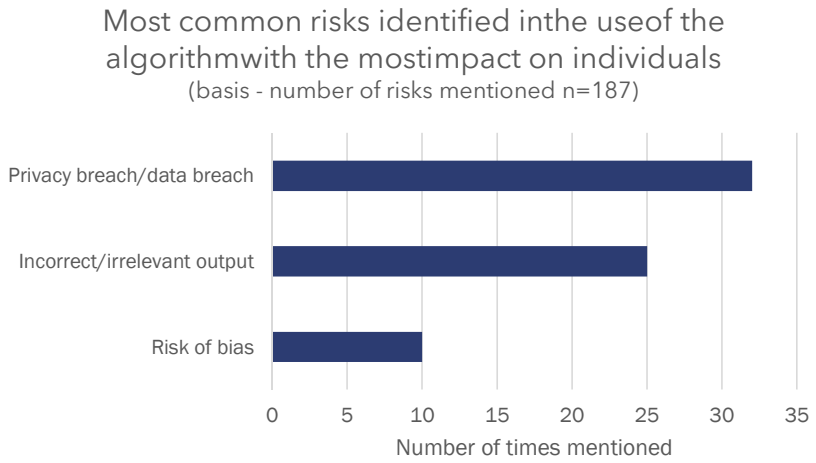


Explanation:

- Specifically for the algorithms with the greatest impact on individuals, organisations prefer a Data Protection Impact Assessment (DPIA), a Privacy Impact Assessment (PIA) or an internally developed assessment.
- In addition, **33% indicate that they did not use a risk analysis tool** for the risk assessment, or were unable to determine which tool was used. This raises questions about the quality of assessments when no tools are used.

The most common risk identified is privacy breach/data breach (1/4)

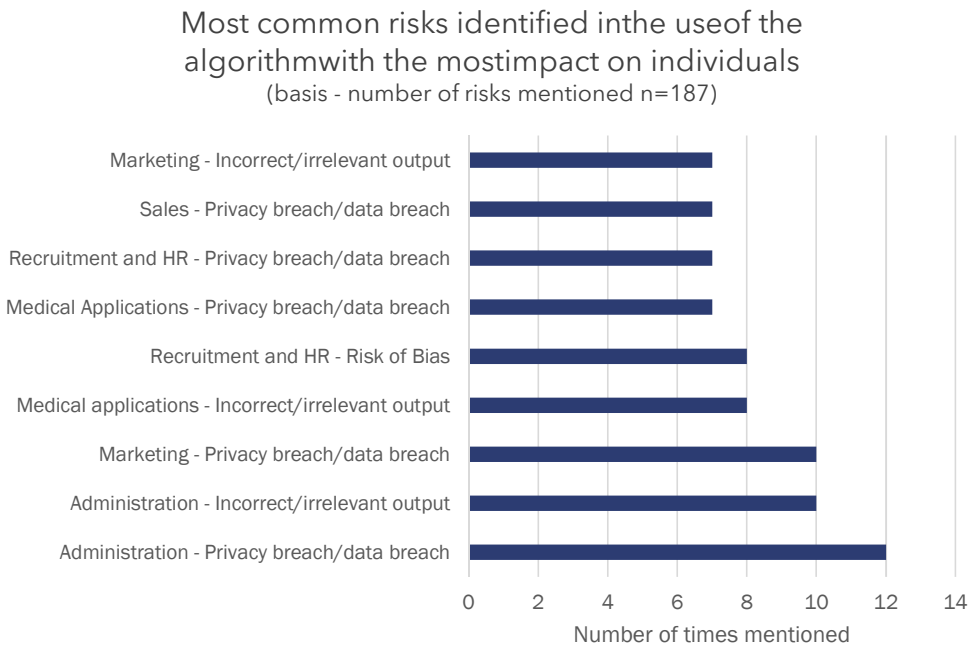
6. Meest impactvolle algoritme



Explanation:

- A total of 187 identified risks were mentioned by the participating organisations. The most common risks are shown below: A privacy breach or a data breach, incorrect or irrelevant output of an algorithm and the risk of bias.
- A striking observation is that a significant number of organisations indicate that they have identified **no risks** when using their most impactful algorithm. It is often argued that the algorithm only makes recommendations, after which a human makes a well-considered decision (*human-in-the-loop*).

The most common risk identified is privacy breach/data breach (2/4)



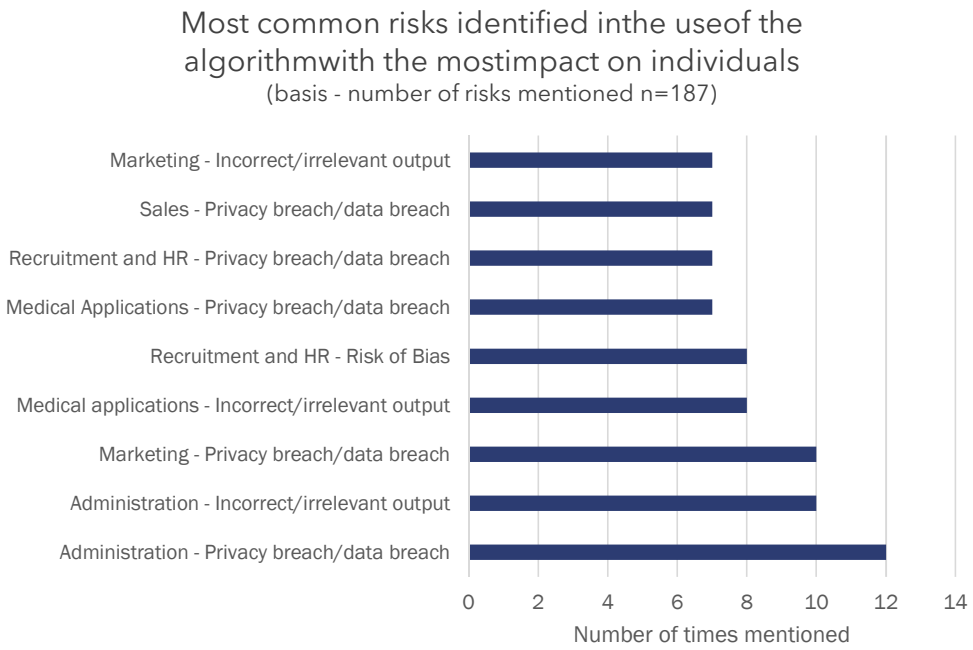
Explanation:

- One of the most prominent risks emerging across multiple areas of algorithm use is **privacy breach and data breach**. This risk is particularly significant within administrative processes and marketing, where twelve and ten mentions of this risk were noted respectively. This finding underscores the critical importance of strict data security and privacy compliance when implementing algorithms.

- The risk of **bias** has been specifically highlighted in sectors such as marketing and recruitment & HR. Within the last category, this risk appears relatively high, with eight mentions. This highlights the need for careful evaluation and monitoring of algorithms to prevent discrimination and unfair outcomes.

The most common risk identified is privacy breach/data breach (3/4)

6. Meest impactvolle algoritme



Explanation:

- In addition, the risk of **incorrect or irrelevant output** is frequently mentioned, especially within medical applications and administration. This finding points to the need for robust quality control and validation of algorithms to ensure the reliability of their output.
- Another important risk is that algorithms **make decisions with a great impact on individuals**, which is seen as a significant risk, especially when it comes to risk profiling of individuals. This highlights the importance of ethical considerations when deploying algorithms and the potential consequences of algorithmic decisions on individuals and their lives.

The most common risk identified is privacy breach/data breach (4/4)

Explanation:

- Furthermore, the risk of **non-compliance and reputational damage** is recognised by a limited number of parties, despite examples showing that the incorrect use of algorithms results in fines and/or reputational damage. Consider, for example, the allowance affair.
- Also, the risk of **a conflict with third parties**, such as algorithm suppliers, is rarely mentioned. This is striking, as 65% of organisations purchase the algorithm with the greatest impact from a third party. Given this observation, it was expected that the risk of a conflict with a third party would be mentioned more often.
- Lastly, the risk of a **lack of transparency** is mentioned once in the application areas of fraud detection, customer service and recruitment & HR. This is remarkable, as relatively many organisations indicate that they do not know which type of algorithm they use. Given this observation, it was expected that the lack of transparency would be mentioned more often. When algorithmic systems lack transparency, individuals cannot know what happens to their data and can hardly defend themselves against decisions made using algorithms.

6.3 Algorithms and decision-making about individuals

Algorithms and decision-making about individuals

Introduction

In this section we provide insight into the extent to which organisations use the algorithm with the most impact on individuals to make decisions about individuals. In the case of organisations using algorithms for decision-making about individuals, we discuss to what extent a human is involved.

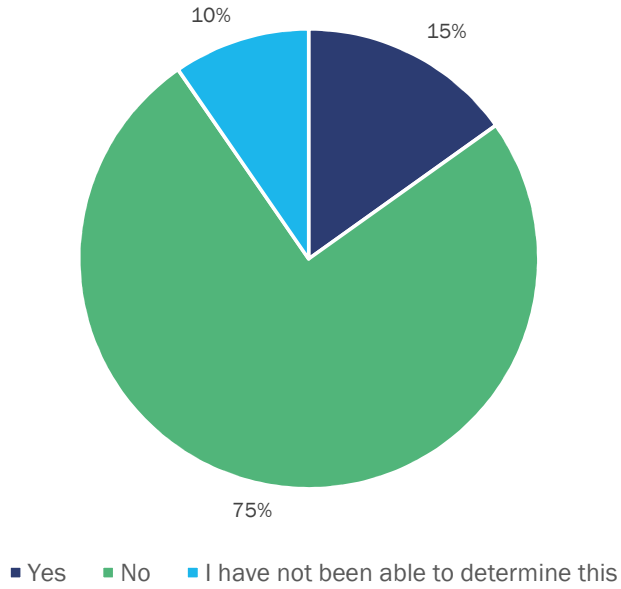
Key points:

1. **In large organisations in the financial services sector, algorithms are relatively often used to make decisions about individuals.** In 75% of organisations, algorithms are not used to make decisions about individuals. In larger organisations in the financial services sector, this happens relatively often.
2. **Decisions suggested by algorithms are at times implemented without a human checking and approving them.** In many cases, this is in conflict with Article 22 of the GDPR, which states that one has the right "not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her."

75% of organisations do not use the algorithm to make decisions about individuals

6. Meest impactvolle algoritme

Is the algorithm with the most significant impact within organisations used to make decisions about individuals?
(Basis - organisations using algorithms , n=707)



Explanation:

- Participating organisations were asked whether the algorithm with the most significant impact is used to make decisions about individuals.
- The results show that only 15% of organisations use the algorithm with the most significant impact to make decisions about individuals. Possible reasons for this could be that organisations are reluctant to use algorithms to make decisions about individuals due to ethical considerations, the complexity of developing a suitable algorithm, a lack of confidence in the accuracy of algorithmic outcomes for individual decisions, or because the organisation does not know exactly what it means to let an algorithm make a decision about an individual.

In large organisations in the financial services sector, algorithms are relatively often used to make decisions about individuals

6. Meest impactvolle algoritme

% organisations that use the most impactful algorithm to make decisions about individuals
(basis - organisations that use algorithms, n=707)

	5 to 19	20 to 49	50 to 99	100 to 499	500 to 1999	2000 or more
A	0%	0%	0%	50%	-	-
BE	20%	0%	0%	5%	15%	8%
F	11%	0%	0%	11%	0%	0%
GI	4%	11%	6%	12%	12%	25%
J	12%	31%	13%	13%	17%	0%
K	10%	20%	50%	33%	56%	55%
L	19%	0%	25%	22%	50%	-
MN	16%	8%	27%	22%	38%	9%
OQ	15%	16%	17%	8%	21%	36%
RS	5%	14%	0%	13%	0%	0%

A Agriculture, forestry and fisheries

B-E Industry (non-construction) and energy

F Construction industry

G-I Trade, transport and hospitality

J Information and communication

K Financial services

L Rental and trade of property

M-N Business services

O-Q Government and healthcare

R-S Culture, recreation, other services

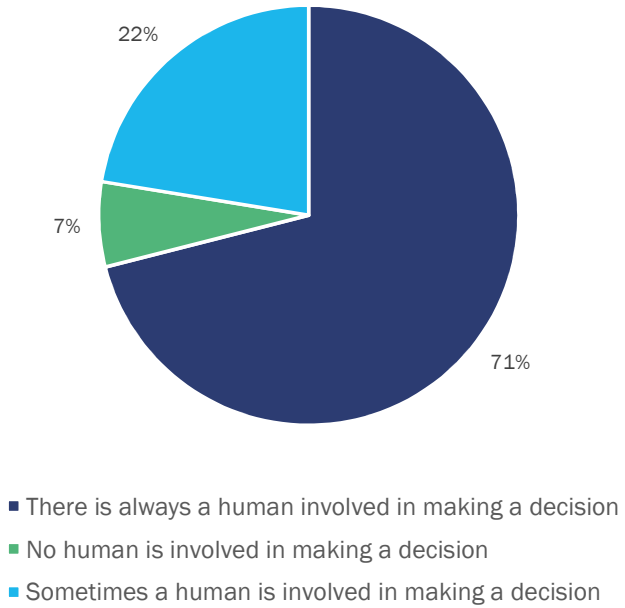
Explanation:

- More than half of larger organisations with more than 500 employees in Financial Services (K) use their most impactful algorithm to **make decisions about individuals**.
- The organisations in sectors F Construction industry and RS Culture, recreation and other services use their most impactful algorithm the **least to make decisions about individuals**.
- There is no clear trend in the use of the most impactful algorithms to make decisions about individuals in relation to the size of organisations.

When algorithms <u>are</u> used to make decisions about individuals, in most cases, a human is involved

6. Meest impactvolle algoritme

To what extent is a human involved in the use of algorithmsto make decisions about individuals
(basis – algorithms used for decisions about individuals, n=107)



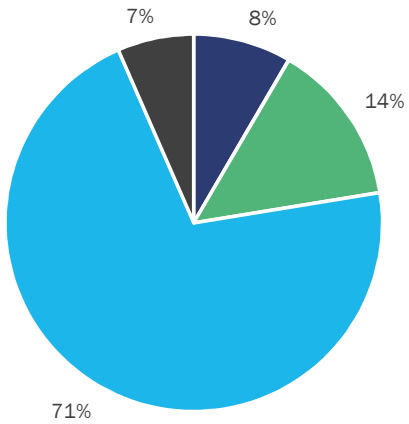
Explanation:

- The chart shows that 71% of organisations always involve a human when using algorithms to make decisions about individuals. This indicates that organisations are choosing a *human-in-the-loop* approach, where algorithms are used to provide analyses or make recommendations, for example, but the final decision is made by a human.
- In addition, 22% of organisations indicate that they sometimes involve a human being in decision-making.
- It is striking that in 7% of the organisations, <u>no</u> human being is involved, while this may be in conflict with Article 22 of the GDPR.

In most cases, an algorithm decision only becomes active once a human has reviewed and approved the decision

6. Meest impactvolle algoritme

In what way is a human involved in the use of algorithmsto make decisions aboutindividuals
(basis – algorithms used for decisions about individuals, n=107)



- A decision by the algorithm becomes effective immediately and is only checked and, if necessary, reversed by a human at the request of the person concerned by the decision
- A decision by the algorithm becomes effective immediately, but is subsequently checked and possibly reversed by a human
- A decision by the algorithm only becomes effective once a human has checked and approved the decision
- No human is involved

Explanation:

- The vast majority of organisations that use algorithms to make decisions about individuals have a human review the decision before it becomes effective (71%).
- It is striking that 7% of organisations use algorithms that make fully autonomous decisions about individuals.

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7. Conclusions & recommendations

Conclusions (1/3)

Conclusion

44% of participating organisations use algorithms, **but the maturity in setting up the governance of these algorithms is low.** In addition, structurally identifying and mitigating risks is in many cases not yet standard practice. Many organisations consider the algorithms they use as non-essential to their business operations. They also rarely use them to make decisions about individuals and make limited use of special categories of personal data. **Smaller organisations with 5 to 100 employees are a point of concern** as they often do not have an internal supervisor, do not perform risk analyses and do not take risk-mitigating measures. **Organisations with more than 500 employees in the financial sector also require extra attention** due to the frequent use of algorithms for decision-making about individuals within this sector.

Conclusions (2/3)

The preceding conclusion is supported by the following partial conclusions:

Significant use of algorithms with limited business relevance

Almost half of the participating organisations use algorithms, but **only 6% consider the use of algorithms to be 'very important'** for the functioning of the organisation. This suggests that there is still a lot of value to be created with algorithms within organisations and that we can expect an increase in both the use and relevance of algorithms in the future. (See Chapter 2)

Mainly simple rule-based algorithms are used

Rule-based algorithms are the most widely used type of algorithms. In addition, it is striking that no less than 43% of respondents do not know what types of algorithms are used. This indicates a possible lack of knowledge about the types of algorithms that organisations use. (See Chapter 2)

Low maturity in algorithm governance

Organisations often assess the level of maturity of their algorithm governance as **'limited' or 'situational',** indicating that maturity is low. This requires improving knowledge and developing more robust governance structures to ensure responsible algorithm use. (See Chapter 4)

Conclusions (3/3)

Conscious risk management is not yet standard practice

Risk analysis, algorithm monitoring, and risk mitigation measures are **not yet standard practice** in about half of organisations. Especially in smaller organisations, there is a lack of conscious approach to risks. Among those organisations that do identify risks, **privacy breaches or data breaches and incorrect or irrelevant output** are the most commonly identified risks. (See Chapter 5 and Chapter 6.2)

High dependency on third parties requires attention

65% of organisations purchase the most impactful algorithm they use **from a third party**. This means that organisations are dependent on third parties when it comes to developing algorithms. This dependency raises questions about, among other things, responsibility, transparency and protection of personal data. (See Chapter 6)

Special categories of personal data, especially in medical applications

In **11% of organisations, special categories of personal data are used** in the algorithm with the greatest impact. It is striking that **in 74% of medical applications** special categories of personal data are used. Their use requires extra attention to the protection and responsible use of these data. (See Chapter 6)

Recommendations (1/4)

Based on these conclusions, Considerati B.V. and Deeploy B.V. make the following recommendations to the AP:

- **Raise awareness about the opportunities and risks of algorithms.** The study shows that many organisations are not yet taking advantage of the opportunities offered by algorithms. It also appears that consciously dealing with the risks of algorithms is not yet standard practice. Furthermore, it appears that organisations find it difficult to determine the type of algorithm they use. This indicates a lack of knowledge. The AP can encourage the adoption of reliable algorithms by increasing awareness of the opportunities and risks of algorithms. With regard to the prudent and lawful application of algorithms, the obligations under the AI Act provide the most logical framework for information provision. The measures prescribed by the AI Act are also useful for non-high-risk AI systems.
- **Pay extra attention to SMEs.** In small and medium-sized organisations, the governance of algorithms is least robust. Find out how the AP, together with other supervisory authorities and stakeholders, can help SMEs with the lawful and prudent application of algorithms.

Recommendations (2/4)

- **Collect best practices together with leading organisations, with a focus on risk identification and monitoring.** We recommend initially focusing on the theme of risk identification and monitoring for algorithms in which personal data are processed, as we see that a large proportion of organisations (43%) do not identify risks prior to using them and only 8% of organisations identify risks during use. As a result, risks may go unnoticed, which could lead to harm to individuals. In order to collect best practices, we recommend entering into discussions with leading organisations, such as those we see within the Culture, Recreation and Other services sector in organisations with more than 500 employees and in the Information and Communication sector with more than 2000 employees. They use many algorithms and perform risk identification.
- **Facilitate the use of regulatory sandboxes for AI systems.** Regulatory sandboxes provide space for organisations to experiment with AI (a subcategory of algorithms) in a controlled manner, according to the EU AI Act. If the AP facilitates these regulatory sandboxes and is closely involved, this can provide valuable insights for drawing up best practices and further shaping targeted supervision.

Recommendations (3/4)

- **Encourage the appointment of an internal algorithm supervisor within organisations.** Nearly half of organisations have not yet appointed an internal algorithm supervisor or have not been able to determine this. By appointing an internal algorithm supervisor, internal awareness of algorithms and their risks can be increased. For example, organisations can appoint an algorithm, AI or ethics officer or assign this role within the privacy team. Smaller organisations can also assign this responsibility at management level. The internal supervisor can then be equipped with best practices from the AP on how risks can be identified and monitored.
- **Special focus on medical applications.** 74% of organisations that use algorithms for medical applications use special categories of personal data. Since these are applications with potentially high impact on individuals, they require special focus. The AP can achieve this by tightening supervision of organisations within the medical sector or by offering these organisations more tools.
- **Special focus on financial services organisations with more than 50 employees.** In this sector, 50% of organisations with 50 to 99 employees and approximately 55% of organisations with more than 500 employees use algorithms to make decisions about individuals. Since these are applications with potentially high impact and risk on individuals, they require special focus. The AP can tighten its supervision of these organisations to achieve this.

Recommendations (4/4)

- **Awareness and monitoring of third-party relationships.** Most organisations (65%) purchase algorithms from third parties. However, hardly any risks are identified regarding the dependency on these third parties. Also in light of the upcoming obligations for users in the AI Act, it is important that purchasers understand what algorithms they purchase and what conditions apply to their use. They must also be aware of potential privacy issues such as security and data transfer. The AP can contribute to this awareness and, together with other stakeholders, develop tools such as vendor assessments, compliance checklists and points of attention for purchasing conditions. In its supervisory role, the AP can monitor compliance with the GDPR.

- **Conduct further studies on organisations that use algorithms to make decisions about individuals without human intervention.** 7% of organisations that deploy algorithms use the algorithm with the greatest impact on individuals to make decisions about individuals, without human intervention. This is not permitted in certain cases under Article 22 of the GDPR. The AP can conduct further studies into this and take action if necessary.

- **Periodically assess how the theme of algorithms is developing within organisations.** This study is a baseline measurement in gaining insight into organisations that use algorithms in which personal data are used. It is recommended that this study, or a condensed version of it, be repeated periodically. This allows the AP to monitor how the use of and handling of algorithms by Dutch organisations is developing.

Recommendations | What can participating organisations do?

Map out which algorithms your organisation uses

Algorithms often process personal data, so be prudent

Be aware of your responsibilities

Assess risks

Take mitigating measures

Charge someone within the organisation with responsibility

8. Appendices

Sample (1/2)

For the study, a sample was taken among Dutch organisations registered with the Chamber of Commerce with **more than 5 employees** and with a head office in the Netherlands. It concerns **120,868 organisations** (population). Government agencies are not part of the population. A **proportional sample** was taken from this population, based on **company size** (in number of employees) and **sector**. Based on company size, the organisations are divided into the following categories:

- Fewer than 5 (not in scope of the study)
- 5 to 19
- 50 to 99
- 100 to 499
- 500 to 1999
- 2000 or more

Sample (2/2)

The sectors are divided into the **following categories** based on the combined SBI codes (Standard Industrial Classification) used by Statistics Netherlands:

- A Agriculture, forestry and fisheries
- B-E Industry (non-construction) and energy
- F Construction industry
- G-I Trade, transport and hospitality
- J Information and Communication
- K Financial services
- L Rental and trade of property
- M-N Business services
- O-Q Government and healthcare
- R-S Culture, recreation, other services

Based on the maximum number of invitations to be sent out, a **proportional random sample** was taken for both characteristics (**company size and sector**) separately. A total of **5690 organisations** were invited to participate in the study.

Data clean-up (1/3)

During the data clean-up, the following checks were performed and choices were made for the benefit of data quality:

a) Consecutive numbers that are incorrect and cannot be linked to a nearly identical consecutive number in the sample, have been retained in the dataset. These can be used for analyses on company size, since the number of FTEs is present in the dataset.

b) It was decided to use the number of employees based on the Chamber of Commerce data as the company size, because this company size was also used to take the sample. The FTE that respondents entered in the survey was therefore not used for the company size

c) If multiple employees of the same organisation have completed the survey (the same consecutive number and the same number of employees), 1 answer (randomly selected) is retained for the analysis.

d) 108 respondents did not move the slider when asked 'How important is the use of algorithms in which personal data are processed for the functioning of your organisation?'. This ended up as an empty value in the dataset. We corrected this by entering '1', which is the default value.

e) In the 2nd pilot, respondents were able to continue to complete the survey if they had indicated that the organisation does not process personal data. For these responses, the answers after the question about personal data have been removed.

f) The response scales for question 4 (for what purposes do organisations use algorithms) were adjusted between the 2nd pilot and the final survey from 1-2,3-5,more than 5 to 1, 2-5, more than 5. To include the 2nd pilot results, it was decided to translate 1-2 to 1 and 3-5 to 2-5.

g) 37 consecutive numbers entered in the survey do not exist in the sample. 31 of these were due to minor typing errors in the survey. These have been corrected. 6 consecutive numbers did not match any sequence number in the sample at all, these have been removed from the dataset, because no information on SBI and company size is available due to the missing sequence number. These are the following:

h) Furthermore, it was checked whether some mandatory results had not been filled in. This is not the case.

Data clean-up (2/3)

i) The distribution of companies based on company size has changed between the 2nd pilot and phase 2. This has been adjusted in the dataset to the distribution in the 2nd phase:

Second pilot:
0: <5
1: 5-9
2: 10-19
3: 20-49
4: 50-99
5: 100-499
6: 500-999
7: 1000-+

For phase 2:
0: <5
1: 5-19
2: 20-49
3: 50-99
4: 100-499
5: 500-1999
6: 2000-+

j) After the sample-based company size codes were linked to the responses in the dataset, the following checks and corrections were performed:

i. If the respondent indicates there are more than 2000 FTEs, we know for sure that there are more than 2000 employees, so it should be code 6. In 53 responses, the code was 1,2,3,4, or 5. These have been changed to 6.
ii. If the respondent indicates there are 500 to 1999 FTEs, the code must be at least 5. However, there are 62 records where the code is 1,2,3, or 4. These have been changed to 5.
iii. If the respondent indicates there are 100 to 499 FTEs, the code must be at least 4. However, there are 122 records where the code is 1,2 or 3. These have been changed to 4.
iv. If the respondent indicates there are 50 to 99 FTEs, the code must be at least 3. However, there are 72 records where the code is 1 or 2. These have been changed to 3.
v. If the respondent indicates there are 20 to 49 FTEs, the code must be at least 2. However, there are 92 records where the code is 1. These have been changed to 2.

Data clean-up (3/3)

k) Conversely, i.e. codes indicating a higher number of employees than the FTE indicated by the respondent have not been corrected. The reason for this is that employees may work part-time, so it is not possible to say with certainty whether the number of FTEs is incorrect.

l) The survey was designed to automatically stop when a respondent indicates that they are not using algorithms. However, in some cases, respondents still completed the full survey and then noted in the comments that they do not use algorithms. We have adjusted these responses.

m) The dataset we used to approach companies was not fully up to date. As a result, some respondents indicated that the company was now inactive. We have removed these responses.

n) Lastly, the datasets from the 2nd phase and the 2nd pilot phase were merged and used for the analyses.

Number of organisations using algorithms by industry/company size category

SBI code/company size	5 to 19	20 to 49	50 to 99	100 to 499	500 to 1999	2000 or more
A	8	7	1	2	0	0
BE	10	12	12	22	13	13
F	9	5	9	9	4	2
GI	27	18	18	33	17	16
J	34	16	8	8	6	3
K	10	5	6	9	9	11
L	16	8	8	9	2	0
MN	25	13	15	23	13	22
OQ	46	19	12	13	14	14
RS	21	7	5	8	1	1

Areas of use of algorithms

Participating organisations were asked in which areas of use they use algorithms in which personal data are processed. These areas of use have been drawn up in consultation with the AP, based on the areas that we often see in practice. These areas of use are described as follows:

- Customer service (e.g. chatbot, prioritisation of customers to contact)
- Marketing (e.g. personalising content, predictive analytics for customer insights)
- Risk profiling of individuals (e.g. predicting credit risk, predicting damage risks)
- Administration (e.g. (partly) automatic processing of invoices, automatic summarising of conversations)
- Purchasing (e.g. (partly) automated selection of contact persons, supplier assessment by algorithm)
- Sales (e.g. lead scoring, retention models)
- Medical applications (e.g. diagnostic support, patient monitoring)
- Fraud detection (e.g. biometric verification, transaction monitoring)
- Education (e.g. proctoring software, personalising learning paths based on performance analysis)
- Recruitment and HR (e.g. automated CV screening, candidate-vacancy matching)
- Behavioural applications (e.g. camera and sensor technology, WiFi tracking)
- Other

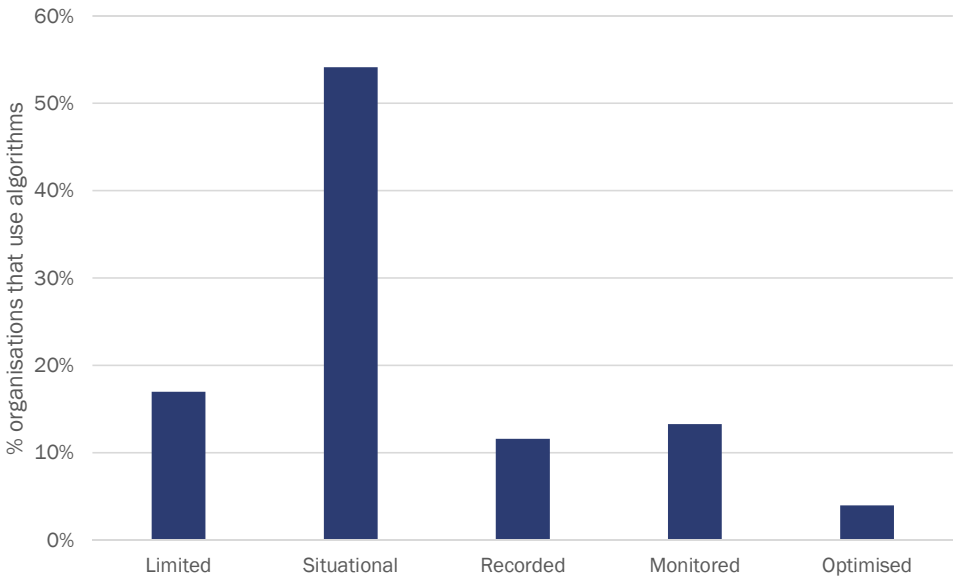
Other maturity measurement results

Pages 32 to 36 discuss the most significant results of the maturity measurement. The following pages show the results of the maturity measurement per topic graphically. This concerns the level of maturity with regard to the following topics: the responsible use of algorithms, the level of knowledge of laws and regulations, the process for implementing new algorithms, awareness of the risks of algorithms and taking measures to mitigate these risks. The level of maturity with regard to the aforementioned topics is assessed according to the following levels:

Limited	There is no awareness regarding this topic within the organisation
Situational	The organisation devises an approach for each situation
Recorded	The organisation has recorded what it wants to achieve on this subject, how, which resources are available for this and within set deadlines
Monitored	The organisation monitors whether the implementation is in accordance with the established objectives. Results are discussed and form a basis for improvement
Optimised	The organisation strives for optimisation on this topic. There is a continuous feedback loop that leads to continuous improvement of processes

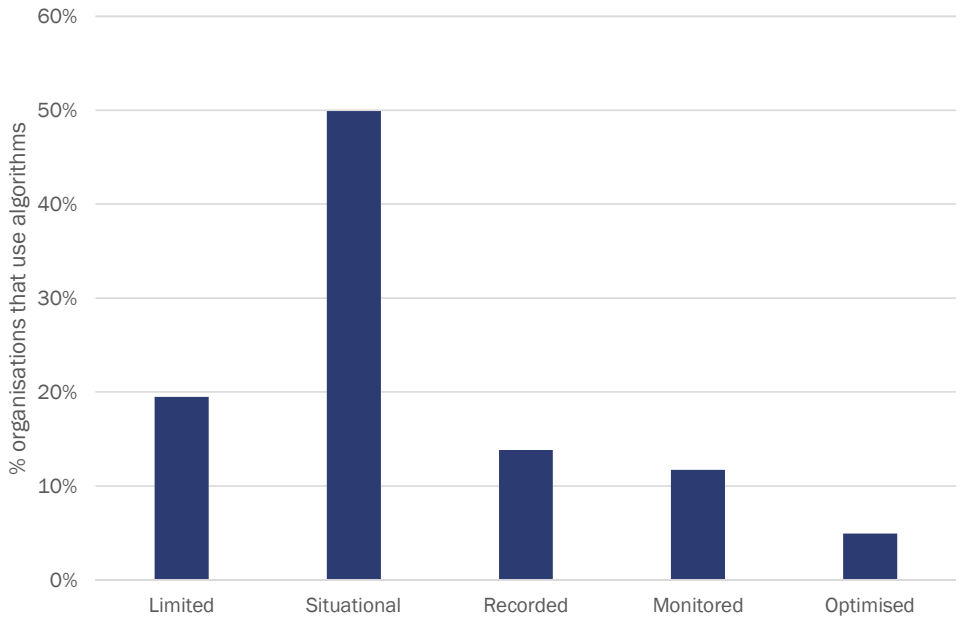
Maturity with regard to responsible use of algorithms

How do organisations assess the maturity of their organisation with regard to the responsible use of algorithms in which personal are processed?
(Basis - organisations using algorithms , n=707)

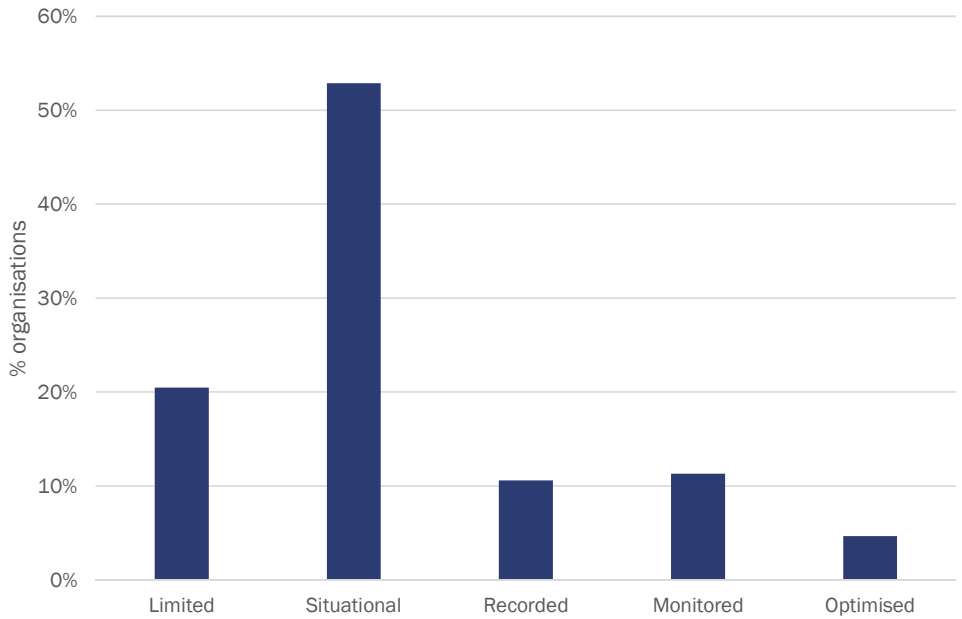


Maturity in knowledge of laws and regulations and existing processes for implementing new algorithms

How do organisations assess the level of knowledge of laws and regulations in the field of algorithms in which personal data is processed?
(Basis - organisations that use algorithms, n=707)



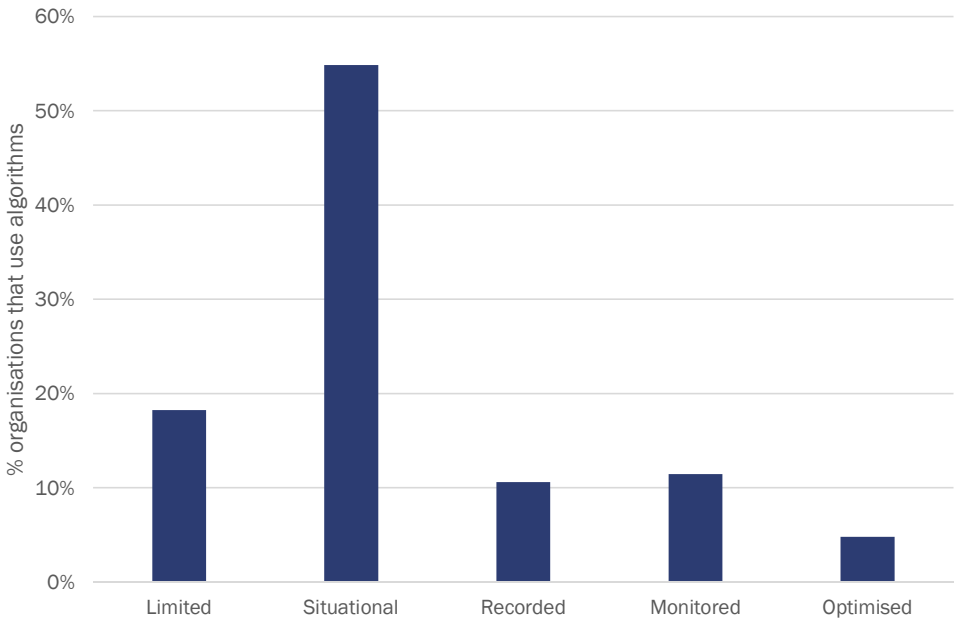
How do organisations assess the process of implementing new algorithms in which personal data is processed?
(Basis - organisations that use algorithms, n=707)



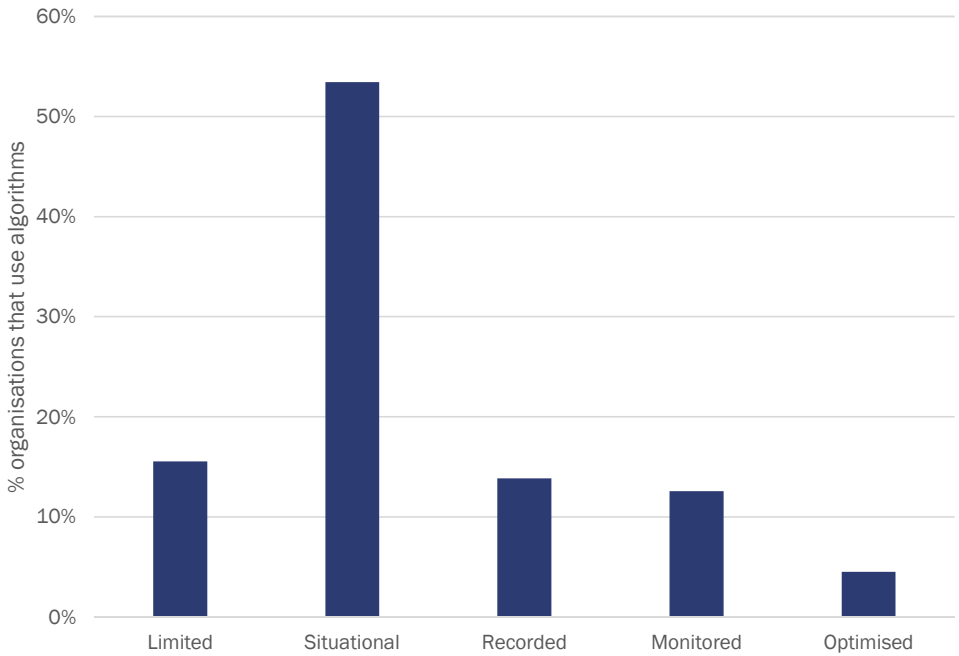
Maturity in assessing risks and taking risk mitigation measures

8. Bijlagen

How do organisations assess awareness of the risks that the use of algorithms in which personal data are processed entails for certain (groups of) individuals?
(Basis - organisations that use algorithms, n=707)

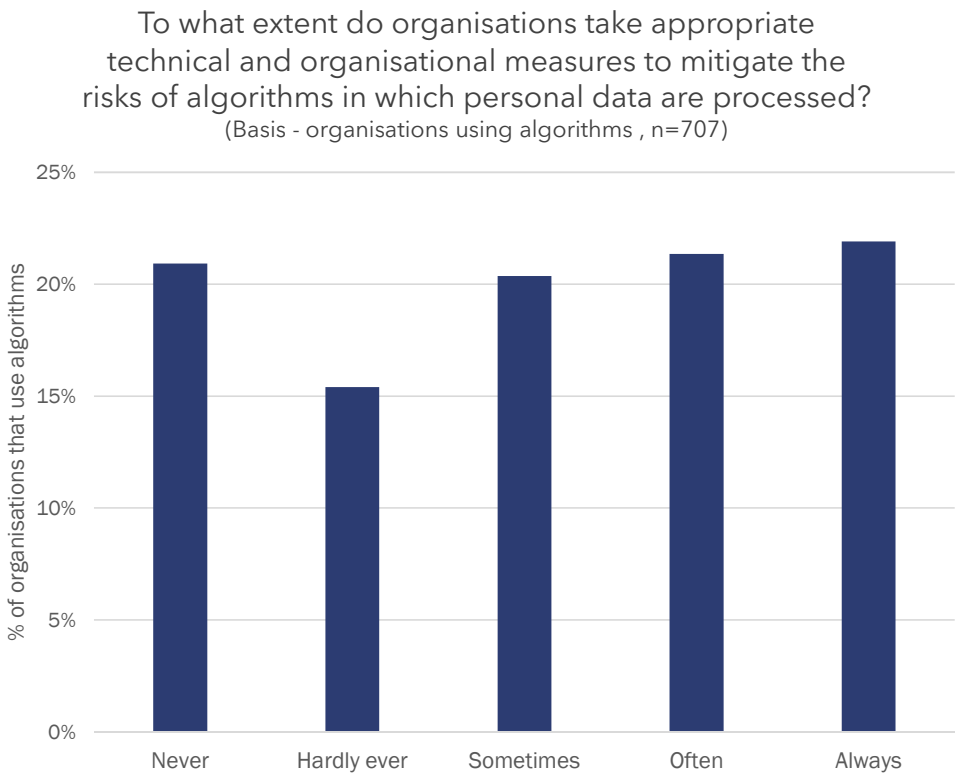


How do organisations assess the internal process of taking measures to mitigate these risks?
(Basis - organisations that use algorithms, n=707)



Widely varying application of risk mitigation measures

8. Bijlagen



Explanation:

- The graph provides a spread picture of the extent to which organisations take technical and organisational measures to mitigate the risks of algorithms. Although almost a quarter of organisations (23%) indicate that they always take measures, more than a third of organisations **never take measures** that mitigate risks.
- The algorithms used by these organisations may not pose significant risks, but if they do, taking appropriate risk mitigation measures deserves more attention.

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