# Algorithmic Transparency in the Public Sector

Recommendations for Governments to Enhance the Transparency of Public Algorithms

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GPAI / THE GLOBAL PARTNERSHIP

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# Introduction

This report is a product of the "Algorithmic Transparency in the Public Sector" project developed by Global Partnership on Artificial Intelligence (GPAI) experts. The project is carried out by GPAI experts from the Responsible Artificial Intelligence and Data Governance Working Groups.

The project's overall objective is to study algorithmic transparency in the public sector, emphasising evaluating reactive and proactive transparency instruments that can enable governments to comply with algorithmic transparency principles, standards, and rules. The project examines the strengths and weaknesses of these instruments, the challenges for their construction, their various uses and users, the costs, how the instruments complement one another, and their possible contributions to transparency and various objectives (e.g., explainability, accountability).

This report analyses the findings of the previous studies (GPAI, 2024; GPAI, forthcoming) and, based on that, presents recommendations for governments regarding the use of instruments to comply with algorithmic transparency principles, standards, and rules. The recommendations will include practical tools such as decision trees and benchmarks to compare the strengths and weaknesses of different transparency instruments.

The Preliminary Report on Algorithmic Transparency in the Public Sector (D1) is a "state of the art" study of multiple repositories of public algorithms available worldwide, trying to identify common features in the construction of these instruments both from the perspective of their content and the way they are built. The second report (D2) is a case study of public algorithm repositories in Chile, the EU, and the UK.

In that sense, the questions that have guided the research are the weaknesses and strengths of the different algorithmic transparency instruments, focusing on the analysed public algorithmic repositories, from which contributions and challenges are concluded. This report is based on desk research, and it considers previous reports.

A summary of the previous research underpinning this report and the main lessons between the two is presented below.

# **1. Main lessons from the previous reports**

Firstly, the Preliminary Report on Algorithmic Transparency in the Public Sector (GPAI, 2024) is a document containing a "state of the art" study of multiple repositories of public algorithms available worldwide, trying to identify common features in the construction of these instruments both from the perspective of their content and the way they are built. The report introduced a fundamental theme that will be key to the entire project: the multifaceted nature of the concept of algorithmic transparency and the different forms of compliance. In conclusion, algorithmic transparency can be understood from a capability, principle, standard, norm, right, and duty/obligation/responsibility perspective. Its importance lies mainly in determining which actors are the "beneficiaries" of Algorithmic Transparency and to what extent the instruments used satisfy or achieve its purpose.



The report identifies and classifies Algorithmic Transparency instruments based on access to information instruments related to algorithmic transparency, offering the following scheme:

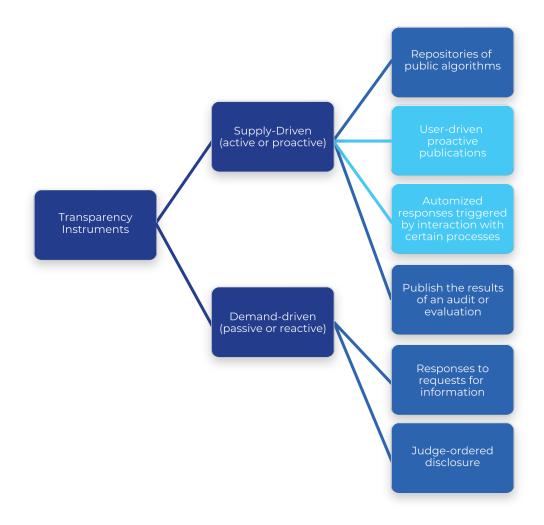


Figure 1: Classification of algorithmic transparency instruments.<sup>1</sup>

This classification includes three tools – the light blue rectangles –currently used as proactive and reactive approaches to algorithmic transparency (online repositories of algorithms, responses to requests for information, and court-mandated disclosures). In addition, two other tools – the white rectangles – could be used for algorithmic transparency purposes (proactive user-driven postings and automated responses triggered by interactions with specific processes). The report analyses public repositories of algorithms worldwide under certain criteria and explains the most used information variables. The report also identifies auxiliary tools incorporated into the repositories and some examples of novel approaches, such as the use of social networks, that allow the display of less static information.

Conclusions of the GPAI A state-of-the-art report of algorithmic transparency instruments (2024):

<sup>&</sup>lt;sup>1</sup> Our classification includes three instruments currently used as proactive and reactive algorithmic transparency approaches (the light blue rectangles that include online repositories of algorithms, responses to requests for information, and judge-ordered disclosures) and two instruments that <u>could</u> be used for algorithmic transparency purposes (the white rectangles that include user-driven proactive publications and automatized responses triggered by interactions with specific processes). Based on our review of the literature on governmental transparency, we believe that the latter could be adapted to serve algorithmic transparency purposes.

- Public repositories of algorithms are designed and published in a variety of formats, from simple PDF documents with tables to Excel or CSV files and interactive platforms.
- Most repositories provide limited information on the existence and use of AI systems deployed by governments. Very few repositories contribute to what the literature has termed as "meaningful transparency," meaning that most repositories do not disclose relevant and sufficient information to evaluate AI systems.
- Al systems are underreported because most repositories report only a few systems. Different
  reasons may explain this finding: the inability or reluctance of governments to evaluate their tools
  (which is not limited to Al systems), intellectual property rights and confidentiality agreements that
  may restrict the type of information disclosed, and cybersecurity concerns that prevent governments
  from disclosing certain information (source code is one of the most protected pieces of information).
- Although some authors, such as Floridi (2020), recognize and celebrate the potential of repositories to promote transparency and even as a replicable tool (which seems to confirm the growing number of algorithms), other authors are more critical of the attributed benefits, such as Cath and Jansen (2022).
- The actual effects/contributions/implications of public repositories of algorithms have not been sufficiently explored.

The second report Algorithmic Transparency in the Public Sector: Case Studies of Algorithmic Public Repositories in Chile, the EU, and the UK (GPAI, forthcoming) is a case study of public algorithm repositories in Chile, the EU, and the UK. These respond to a careful selection of representativeness by considering different dimensions of the repositories by the team guiding the research, responding to criteria such as territory, typology, dependence, financing, etc. The main objective of the second part of the study is to evaluate the effectiveness of these repositories as instruments of algorithmic transparency in the public sector, considering their strengths, weaknesses, challenges, and contributions to transparency in different governmental contexts.

The methodology used in this report is based on a qualitative analysis, including interviews with the main agents involved in the creation, management, and operation of these repositories. The interviews provided valuable information on the processes of design, implementation, and use of the repositories, as well as the difficulties and solutions adopted in each case. The analysis also included a documentary review of the regulatory and administrative frameworks governing each repository, complemented by official data. The results show that although the three repositories share the common objective of promoting transparency in the use of public algorithms, there are significant differences in their approach, scope, and regulatory framework. In the case of Chile, an approach based on voluntary engagement and self-regulation is observed, while the European Union has a more robust legal framework that establishes clear requirements for algorithmic transparency. Meanwhile, the United Kingdom uses a combination of administrative guidelines and public commitments to promote transparency.

Overall, the report's findings highlight the importance of considering the local context and the specific needs of each jurisdiction when designing and managing public repositories of algorithms, as well as the need to adopt a flexible approach that can adapt to different regulatory frameworks and societal expectations.

As conclusions from the case study, it is possible to point out that the contribution of each repository to algorithmic transparency varies in the scope and depth of information provided, but all case selection and publication processes involve established criteria for their processes and demonstrate a commitment to collecting information relevant to public sector work.



#### Main lessons from the previous reports

Algorithmic transparency instruments - A state-of-the-art report (2024) highlighted the importance of public algorithm repositories as key tools for fostering transparency and accountability in using automated systems in the public sector. The report also found that most public algorithm repositories currently available worldwide are concentrated in Western Europe and the Americas. At the same time, the second report *Algorithmic Transparency in the Public Sector: Case Studies of Algorithmic Public Repositories in Chile, the EU, and the UK report* (GPAI, forthcoming) confirms the findings about the public value generated by repositories of public algorithms. The comparative case study explores three examples illustrating how different repository approaches can enhance algorithmic transparency.

#### Standardisation of algorithmic transparency in the public sector

Related to the variety in which repositories are structured, both in terms of formats and information, the qualitative analysis demonstrates that in the case of the United Kingdom, the "Algorithmic Transparency Standard" is committed to transparency by standardising the information disclosed about algorithms used by the government. The European Union, through the Artificial Intelligence Act (AI Act), reinforces transparency through a robust legal framework that establishes specific requirements for the disclosure of algorithms in the public sector, including the possibility of developing free AI components in open repositories. Chile adopts a more flexible approach based on voluntary commitments and public participation but faces significant challenges regarding resources and sustainability. As outlined in the first report, A state-of-the-art report of algorithmic transparency instruments, which exposes 75 active cases of algorithmic repositories, 37 correspond to the United States. This large number, as the report explains, is due to Executive Order 13960 of 3 December 2020, 'Promoting the Use of Trusted Artificial Intelligence in the Federal Government', which mandates that each federal government agency 'shall prepare an inventory of its unclassified and non-sensitive AI use cases, which would partly explain the increase in the number of repositories in the United States. However, it is important to note that there is a wide dispersion of data, varying descriptions of variables, and generally little uniformity of the cases presented therein.

#### Diverse models for building and implementing repositories of public algorithms

On the one hand, the first report (GPAI, 2024) identified a variety of algorithmic transparency instruments used globally, highlighting that no single approach fits all contexts. On the other hand, the second report (GPAI, forthcoming) elaborates on this diversity by examining how three jurisdictions and three different models of algorithmic repositories analyse and implement mechanisms to promote transparency, adapting to their respective regulations and social contexts.

In the UK, transparency is managed through mandatory administrative guidelines that seek to unify disclosure criteria across the public sector. The European Union follows a more centralised and regulated approach, with the AI Act imposing clear obligations to ensure that algorithms are used ethically and transparently. In Chile, the approach is more participatory and voluntary, reflecting a combination of self-regulated practices and collaborative efforts. This diversity of approaches reflects the findings of the first document (GPAI, 2024) on the need to adopt flexible solutions that fit local realities and existing legal frameworks.

#### Implementation challenges



Furthermore, even in common practices such as implementing public algorithm repositories, the results are diverse, a topic discussed in depth in the second document (GPAI, forthcoming). This leads us to consider that addressing public algorithm repositories from a generalised perspective implies ignoring contextual differences and, consequently, falling into an erroneous analysis of their actual impact. In this sense, for a proper study of the benefits associated with the implementation of public algorithm repositories, it will be essential to consider the multiple factors involved in each specific context, such as available resources, governance infrastructure, culture, and above all, the particular objectives of each government regarding Algorithmic Transparency.

The research titled "Algorithmic Transparency in the Public Sector: A state-of-the-art Report of Algorithmic Transparency Instruments" identified several general challenges in implementing repositories of public algorithms, including the lack of common standards and interoperability issues between different jurisdictions, data dispersion, limited information, the need for catering for diverse types of users, costs of implementation, maintenance, and upgrades, and overlapping governance structures. Algorithmic Transparency in the Public Sector: Case Studies of Algorithmic Public Repositories in Chile, the EU, and the UK report, on the other hand, offers a more detailed understanding of these challenges, providing specific examples of how they affect each context studied.

The second report highlights the lack of interoperability as a recurring obstacle. Although significant efforts are being made to standardise information disclosure in the United Kingdom, problems remain related to the harmonisation of criteria between different entities. In the European Union, the regulatory framework provides a solid foundation but faces challenges related to effective implementation and supervision.

In Chile, the lack of regulation, resources, and reliance on voluntary commitments complicates the long-term sustainability of the repository. However, in this last case, the recent recommendations of the Council for Transparency, published on August 30, 2024, in the Official Gazette through Exempt Resolution No. 372 of 2024, following the interviews conducted in this study, may indicate a change in this direction. The recommendations are voluntary regulations, and although they do not mandate the creation of a repository of algorithms used by the public sector, they generate recommendations for "proactive transparency," seeking that the agencies continue publishing certain information on algorithmic systems that may affect the fundamental rights of individuals or their access to services and benefits. For this purpose, three subtopics are contemplated regarding the information to be published: the systems used by the obliged subject, the services or procedures in which the algorithmic systems are used, and general aspects of the operation, such as its objective, the logic of the system, and the categories of data used.<sup>2</sup> These recommendations consider the joint work with the public innovation lab of the School of Government (GobLab) at Universidad Adolfo Ibáñez, which began with a study in 2021 that detected the use of automated decision systems in public institutions in Chile and continued with the agency's participation in the project "Ethical Algorithms," recognizing the need to improve various areas related to transparency. Under the Recommendation, the information will be disseminated in each public institution, which may or may not publish it on its "active transparency" site. However, this is the first step that provides positive signals about the future of algorithmic transparency and how repositories are built, which is information that can be consumed from the Public Algorithms repository if it is published in open and interoperable formats.

<sup>&</sup>lt;sup>2</sup> Consejo para la Transparencia. (2024, September). *CPLT launches recommendations for algorithmic transparency in public services.* Retrieved from

https://www.consejotransparencia.cl/cplt-lanza-recomendaciones-de-transparencia-algoritmica-en-servicios-publicos/



#### Financial sustainability challenges

Along these lines, concerning the challenges of interoperability and standardisation, the second report (GPAI, forthcoming) highlights other problems that the first report (GPAI, 2024) had addressed more broadly. For example, the financial sustainability of repositories is presented as a crucial challenge. The first report, "Algorithmic Transparency in the Public Sector: A state-of-the-art report of Algorithmic Transparency Instruments", mentioned the need for continuous funding, while the second report (GPAI, forthcoming) provided specific examples, such as the situation in Chile, where the lack of resources compromises the effectiveness of the repository. In this sense, one of the problems of the lack of resources resulted in the lack of experts in the construction of the repository and the fact that the various people responsible for it failed to adequately unify criteria, thus affecting the quality of the repository. This point underscores the importance of considering innovative and collaborative financing mechanisms to ensure that repositories are operational and updated. Ideally, the government would manage these repositories as a social good initiative, so the funding aspect might not arise in such scenarios. For private repositories, having it also becomes a challenging task with a goal-oriented rationale related to the mission, as in the university case.

#### Adapting the transparency strategy to the context

Likewise, the second report (GPAI, forthcoming) emphasises the need to adapt transparency strategies to each jurisdiction's characteristics and capacities. While in the United Kingdom and the European Union, more formal and structured approaches are observed, Chile focuses on flexibility and community participation. This includes journalists and media that bring attention to these algorithms and contribute to public interest research, which are key strategies although limited by regulatory and budgetary restrictions, as mentioned above.

Thus, it became evident that this report (GPAI, forthcoming) confirms and deepens the key points identified in the state-of-the-art report (GPAI, 2024), providing an empirical basis that validates the importance of public algorithm repositories as a mechanism for transparency while highlighting the diversity of approaches and the specific challenges each context faces. This provides a more comprehensive and practical perspective for understanding how these tools can be improved and adapted in different government contexts, which will be addressed in the following sections.

#### Limitations of the available information

Among the findings, it is highlighted that most repositories **provide limited information** on the existence and use of algorithmic and AI systems deployed by governments. A reason that may explain the latter is the lack of mandate and the value these repositories may have in the long term. Very few repositories contribute to what the literature has termed "meaningful transparency,"<sup>3</sup> meaning that most repositories do not disclose relevant and sufficient information to evaluate AI systems.

In addition, AI systems are under-registered because most repositories only report a few systems. Different reasons may explain this finding: lack of awareness of the 'repository' initiative in general for the community that should report, lack of legal obligation to do so and lack of sanctions for non-compliance, the inability or reluctance of governments to evaluate their tools (which is not limited to AI systems, but to algorithms in general), intellectual property rights and confidentiality agreements that may restrict the type of information disclosed and cybersecurity concerns that prevent governments from releasing certain information (source

<sup>&</sup>lt;sup>3</sup> The concept of Meaningful Transparency (Ada Lovelace Institute, n.d.): providing the public with the tools and information needed to evaluate and interact with ADM systems in public services.



code is one of the most protected information), the intrinsic complexity of this technologies in a way that is understandable to the general public can be a challenge. Governments may choose not to disclose detailed technical information to avoid misunderstanding or misinterpretation. In other cases governments develop innovative technologies that may have high commercial value, disclosure of this information could allow private companies to take advantage of these developments without making the necessary investments in research and development; or also political reasons such as fear of public backlash from automating tasks because they fear it may undermine their authority or expose questionable practices.

As a preliminary conclusion from both studies, it is possible to indicate that:

- 1. Repositories provide only limited information on the existence and use of algorithmic and Al systems employed by governments. Al systems deployed by governments.
- Each repository's contribution to algorithmic transparency varies in the scope and depth of information provided, but all case selection and publication processes involve established criteria for their processes and demonstrate a commitment to collecting information relevant to public sector work.
- 3. Very few repositories contribute to what the literature has termed "meaningful transparency," meaning that most repositories do not disclose relevant and sufficient information necessary to evaluate AI systems.
- 4. Under the premise of democratising the use of AI or algorithms in the public sector, repositories are ultimately used by civil servants, a literate audience, or professionals educated in data science language.
- 5. The repositories do not have greater visibility or publicity from the responsible institutions on their official web pages or social networks, so they are primarily assumed to be for operational purposes.

Although repositories contribute to Algorithmic Transparency, a multifaceted concept, their contribution is limited because transparency can be understood differently. In this case, a repository exposes a sample of states' capacity to automate processes and their correlative duty to account for the results of that automation.

# 2. Contributions and challenges of designing and operating Repositories of Public Algorithms

Transparency is constantly mentioned in artificial intelligence (AI) principles and guidelines as a call to open up "black boxes" and algorithmic systems to generate more trust in their applications. As indicated in the classification of the transparency mechanisms proposed in this study identified in the first report, these should not be considered separately or mutually exclusive. No single mechanism, on its own, is sufficient to guarantee a complete evaluation of algorithmic systems. Therefore, achieving true algorithmic transparency requires an overall strategy that dynamically combines several mechanisms.

However, some knowledge gaps persist, often exceeding algorithmic transparency initiatives' scope. Whatever they may be, implementing algorithms and AI for the automation of tasks that may affect people's rights and lives, is also related to adequate digital literacy among users, cultural change, and education. Therefore, there is a need for training or awareness-raising on how algorithms are used, what their impact on people can be, and how they are implemented to make decisions in public affairs, and only from there could the usefulness of transparency initiatives be strengthened.



From the previous case study on the analysis of public repositories of algorithms, it is possible to add additionally a number of important challenges related to the difficulties in their construction and maintenance. Thus, maintaining a platform can pose challenges in itself, in addition to gathering information. This section addresses several challenges and contributions documented in the two previous reports and then offers possible solutions in the following section.

# 2.1 Challenges

# 1. Lack of specific regulations and homogeneity

A fundamental problem is the lack of regulatory frameworks that could be defined as "models" that clearly define transparency standards for algorithms used by the public administration. Although some national laws have general transparency obligations, regulations vary significantly between countries and jurisdictions, making it challenging to apply and implement public algorithmic transparency obligations in repositories uniformly. It is important to highlight that geographies with regulations like the EU and USA have a higher number of repositories compared to others. Moreover, there is no homogeneity in a minimum set of information that contributes significantly to an algorithmic transparency registry.

# 2. Contextual limitations of existing repositories

Current repositories have significant limitations in their ability to promote meaningful algorithmic transparency. They do not allow for adequate assessment of the overall context of algorithm implementation, nor do they provide sufficient understanding for citizens affected by automated decisions. Additionally, the information they provide is not always accessible or understandable, which reduces its usefulness. Indeed, there is a lack of a common framework available for Algorithmic Transparency, and it will be good for technical bodies like the IEEE (Institute of Electrical and Electronic Engineers) or the Association for Computing Machinery (ACM) to come up with a recommended list. Further, the International Organization for Standardization, ISO, can take it up as an item and publish an international standard. This will help countries align on the standards and make it easier for AI developers to come to a consensus and publish these aspects.

## 3. Lack of resources and sustainability

The implementation of algorithmic transparency mechanisms requires permanent resources, both financial and human. Many governments face difficulties in allocating the necessary funds for the creation, maintenance, and updating of public algorithm repositories, as well as for training the appropriate personnel. This is evidenced in the case of the UAI Public Algorithm Repository (Chile), a self-managed initiative supported by the budget of a self-financing centre. A lack of resources may directly affect the effectiveness and long-term sustainability of these repositories. On the other hand, the allocation of funds depends on the priorities of governments, and most governments do not yet see the value of these repositories because the benefits are not yet clear. If the benefits were clear, there would probably be less problems with sustainability.

## 4. Limits concerning the protection of sensitive information and legitimacy



Another key challenge is balancing transparency with protecting sensitive and confidential information, such as personal data, trade secrets, intellectual property, or algorithms that could be misused. Disclosure of detailed information about algorithms could compromise security, the very effectiveness of the systems, and, in some instances, the entities' intellectual property. Meanwhile, a lack of transparency could undermine public confidence in these systems. The boundaries of what information should be kept proactively available will always be a challenge for repositories due to the fact that public algorithms may be designed to serve different purposes, and the disclosure of information may affect the effectiveness of their tasks.

# 5. Repository updates and maintenance

Keeping repositories up to date is a critical challenge. Here we refer to updating information, which may be related to new algorithms to be published, new versions of algorithms, updates to their operation or changes in the amount and type of data used, as well as removing obsolete or inaccurate records.

As observed in the case study, not all repositories are committed to updating, due to their scope, the way they are designed, their objectives, etc. Updating information certainly contributes to transparency and could be facilitated by the establishment of updating policies, regulations that make it mandatory to keep information updated on a regular basis, and finally, depending on the sophistication of the repositories, through technology that facilitates the standardisation of information, such as adding an automatic periodic updating step through workflows defined at the information publication stage.

# 6. Lack of key performance indicators (KPIs) to measure the contribution of the repositories

A significant challenge is the lack of clear and objective indicators to measure the impact and effectiveness of public algorithm repositories effectively. Without these KPIs, it is difficult to assess whether repositories are fulfilling their purpose of improving transparency and accountability. As discussed in the second report (GPAI, forthcoming), the repositories studied did not typically undergo performance evaluations, as the teams behind them are currently focused on expanding these initiatives, which have only recently been made publicly available. However, KPIs should be related to the main objectives of the repositories, which may be linked with transparency, as the ultimate goal. KPIs can also refer to objectives such as costs, automation efficiency or other related aspects.

## 7. Limits concerning the objectives of repositories

A repository by itself does not allow the evaluation of algorithmic systems; through them, it is only possible to identify practices without adding connotations regarding efficiency, optimization, or effectiveness of public processes in which algorithms intervene.

A repository makes it possible to know when the algorithms operate, but in general, they do not provide information to understand how they operate in each specific case where there could be a particular impact, focusing clearly on the information disclosure component. It is difficult to draw and formulate critical evaluations from the information available in these registries.

But in fact, the birth of repositories is recent and the practices and objectives are just being consolidated. It is possible that in the near future, repositories will incorporate generalised tools that allow greater access to the information made available in them, develop the correct objectives, KPIs, funding, interoperability, etc.



#### 8. The use of repositories is still encapsulated in a specialised audience.

Although a stated objective of the repositories studied is to democratise technology by making information about algorithms accessible to the public, discussions surrounding algorithmic governance remain encapsulated within an expert audience, with the users of these repositories being the same public officials and researchers, rather than the general public. Citizens should be the primary audience of repositories. Academics and researchers should be the secondary. On the other hand, journalists and civil society should be the main stakeholders in picking data from here and writing about them so citizens are aware of the use of algorithms. Citizens should be the primary audience of repositories. The purpose of publishing algorithms can often be highly technical, with little usefulness to the average citizen. A registry of algorithms will not have the expected effect if the average person cannot understand the information. Prioritising citizens does not mean that they should be the only audience of repositories, but that they should be considered at least one of the relevant audiences, in the sense that the transparency that repositories provide is related to new ways in which access to public information right should operate, which as a human right is part of the rights of citizens.

On the other hand, repositories can confuse expectations; many expect a high level of technical rigor from them that is incompatible with understanding from the average user's perspective.

#### 9. Potential incompatibilities between system design and transparency expectations

Depending on the degree of transparency required, the repositories generate challenges for systems that were not designed to be open. In other words, transparency considerations were not included in their acquisition or design because they were not deemed a relevant or necessary requirement. However, this aspect has never been reviewed. The degree of openness of a repository's information should be consistent with the openness with which the systems were conceived to not overburden the public sector. Another crucial aspect to consider is the interoperability of information, as simply opening information in repositories does not guarantee its usefulness. Openness of information means making it publicly available, but it does not necessarily mean that it is accessible or easily understandable to all users. For transparency in algorithm repositories to be even more effective, data must be not only accessible, but also interoperable. This means that different systems and platforms used by different institutions or actors, both public and private, must be able to share and process that information seamlessly.

Interoperability ensures that information can be integrated and used consistently across different contexts and technologies, can be analysed in a more complete and detailed way and put into a common context, facilitating collaboration between entities and expanding the ability of citizens to use data in a meaningful way.

# 2.2 Contributions

#### 1. Openness and visibility of algorithmic processes

Transparency in the algorithms used by the public administration is fundamental to fostering public trust, feedback, scrutiny, and improvement. Promoting the registration of algorithms creates spaces for the openness of these processes, facilitating public scrutiny, which can help to identify potential errors or biases in their implementation. This not only improves the quality of decision-making but also empowers citizens by making them active participants in policy analysis and evaluation.



### 2. Evaluation and accountability

Algorithms must be subject to a rigorous evaluation and accountability process. This means that the impact of algorithmic decisions should be measured, in terms of their effectiveness, expected outcomes, and increased access to public services, depending on the context in which they are embedded. In this context, registers of algorithms facilitate ex-post processes that allow the state to be held accountable for its actions, ensuring that it acts responsibly and with a focus on continuous improvement.

#### 3. They allow for evidence-based impact analysis.

Studying the effects of algorithms on society is essential to understanding their benefits and risks. The Public Algorithms platform in Chile is an example of how evidence can be used to drive effective regulation. The Public Algorithms platform has served to exemplify the need to generate certain minimums of evidence-based regulation, as has been the case in the legislative process of the future Personal Data Protection Law.<sup>4</sup>

#### 4. Use Cases and replicability

Algorithm registries make 'use cases' visible, allowing other entities to learn from previous experiences and adopt technologies that have proven to be effective in similar contexts. This not only optimises resources but also accelerates the implementation of innovative solutions in public administration, increasing the effectiveness and efficiency of the services offered.

#### 5. Allows the establishment of standards and criteria

Algorithmic repositories allow the development of taxonomies and definitions and a minimum corpus of information relevant to the initial standardisation of algorithmic transparency to meet specific normative criteria, e.g., access to public information.

#### 6. Allow graded levels of transparency without full disclosure

In cases where it is not appropriate to make public information that may affect the effectiveness of algorithmic processes (such as source code) or complete datasets, registries can offer an intermediate solution. By providing relevant information without compromising security or privacy, trust in algorithmic processing systems can be increased while protecting sensitive information.

For example, audit agencies are likely to be reluctant to higher levels of algorithmic transparency because of the well-founded fear that algorithmic audit methods will be overlapped by the auditees, resulting in ineffective public audit work, such as disclosure of metrics, codes, or parameters. Repositories can provide sufficient information to be able to interact with these algorithms, such as the existence of an automated process at a certain point in the citizen's interaction with the audit agency, meeting levels of transparency that at least satisfy some legal standard of access to public information or transparency.

#### 7. They can help to generate governance mechanisms

In the face of regulatory gaps in the interaction between citizens and algorithmic systems, registries offer a way to properly 'govern' these systems by providing structured and accessible information. Guidelines

<sup>&</sup>lt;sup>4</sup>Garrido, R. (n.d.). Una trampa del Derecho. Retrieved from https://www.uai.cl/columnas/gobierno/una-trampa-del-derecho



could be established to align the use of algorithms with the interests and rights of society, promoting a fairer and more equitable interaction.

### 8. Promote the ethical adoption and use of AI

Documenting algorithms' uses is crucial in identifying and mitigating ethical risks, such as bias and discrimination. Documenting algorithmic applications is also essential for fostering ethical practices in artificial intelligence. Organisations can clearly understand their functionalities and potential impacts by maintaining comprehensive records of algorithm development and deployment.

# 3. Recommendations for enhancing algorithmic transparency in the public sector

As we have seen, the growing adoption of ADM systems in public administration has underscored the need to strengthen algorithmic transparency mechanisms to keep a check and have ethical AI systems in place to keep a check and have ethical AI systems in place. As a basic premise, we should consider that the algorithms used in the public sector are subject to administrative and public law rules, which implies that they must operate under principles of transparency that guarantee the publicity of the actions of State bodies. However, numerous challenges impede the effective implementation of transparency in the use of these algorithms. This report identifies several key challenges, and this section will focus on providing practical recommendations to address them, along with tools such as decision trees to guide policymakers in their implementation.

The following is a set of recommendations for governments that intend to develop new repositories of public algorithms and for those that have already published repositories and wish to enhance them:

# 3.1 Recommendations for governments that intend to develop new repositories of public algorithms

- Develop a minimum corpus of content / metadata for public algorithm repositories. In line with the
  previous recommendation and considering the diversity of existing repository cases, we suggest the
  creation of a standards committee, a working group with representatives from different disciplines to
  develop consensus standards, using ontologies to describe the structure and meaning of the data in a
  formal and shared way.
- Create the repository with open and interoperable standards. Implementing public algorithms requires that the information can be shared and used by various forums and stakeholders. Repositories should be developed in such a way as to facilitate the comparison of data between different jurisdictions, thus allowing for a more efficient use of data.
- 3. Examine the applicability of regulation. Define, through regulatory studies and administrative experience, the regulations' applicability on access to public information, data protection, or other in the field of algorithms. Define whether administrative rules are necessary to define the transparency obligations in the field of algorithms, considering grounds for secrecy, including intellectual property rights, or limitations to challenge automated decisions.



- 4. Delimits the scope of the information to be published, specifying the range of algorithmic tools covered by a possible registry of public algorithms. Identify mechanisms that could be complementary to transparency. The repositories offer limited information in scope and objectives, so it is recommended that additional mechanisms be identified that complement the existing transfer challenges. Thus, regulations could be dispersed in data protection laws, access to public information, government audits, public procurement, open data, and data governance. A strategy of public algorithm repositories cannot be designed in isolation from other regulations that could impact the concept of "transparency," which can have several objectives: that citizens understand how algorithms affect their rights, that spending on Al implementation is controlled, that data is shared, etc., and with mechanisms that allow the creation of safeguards for transparency. Update periods must also be defined, which may be related to specific legal obligations or, if no such obligations exist, defined in the repository governance.
- 5. Implementing a repository of algorithms will require the definition of specific teams who will be involved at different levels in the definition of the information to be disseminated. These are not only technical issues but also legal issues, specific areas of systems management, communication, design, and usability.Internal data governance structures will need to be redefined, awareness will need to be raised in other departments, and training will need to be provided to the AI implementation team or even to the vendors providing services to the government.
- 6. Define the target audience and cater the accessibility, scope, and comprehensibility of the information accordingly. As concluded in the case study report, there are diverse audiences interested in algorithm repositories, each with particular needs and constraints. It is critical to define who the primary audience will be, without neglecting other potential audiences, recognising the diversity of these and the specific needs of each group.
- 7. Hand in hand with a public algorithm registry standard, implementers should ensure that the information published in the repositories is accessible and understandable to the target audience. This implies creating guides, explanatory summaries, or user-friendly interfaces that translate technical language into simpler terms. Repositories are the first step to deeper transparency, one in which affected citizens can interact with algorithms meaningfully, evaluating their decisions and making informed criticisms. The repository should be the logical link to explainability, even if it does not itself provide it.
- 8. Develop anonymization and de-identification protocols that balance transparency with protection of privacy rights.

It is essential to establish clear protocols for the anonymization of personal data and the de-identification of sensitive information before publishing details of algorithms as a baseline criterion for repositories that publish data. While data protection legislation exists in most countries worldwide, not all authorities have developed guidelines for effective anonymization or open data publishing. This will protect the privacy of citizens and the intellectual property of developers while ensuring an adequate level of transparency. At the same time, it requires adapting repositories to state-of-the-art legislation in this area, such as that of the EU.

9. It is possible that there are cases in which the repository does not aim at public transparency of algorithms, in that sense the practical recommendations that are promoted may be oriented towards accountability through the selective publication of examples of use, and may choose to publish



specific examples of how certain algorithms are used in specific situations that are of public interest (for example, in public procurement processes, project selection or public policies). This would help demonstrate how algorithms influence decisions without the need for disclosure. Publishing summaries of decisions or cases where algorithms are used, with explanations of how they contribute to decision-making, would also allow the public to understand that the government is making technology-informed decisions, without necessarily sharing full technical details.

# 3.2 Recommendations for governments that currently have repositories and aim at enhancing them.

- 1. Establish standard criteria and procedures for the periodic updating of repositories. Governments should implement standard procedures for the periodic updating of algorithm repositories. This includes regular review of registered algorithms, updating information based on algorithm or data policy changes, and removing obsolete or inaccurate records.
- 2. Promote the use of automated tools for updating data in repositories. Integrating automation technologies, such as artificial intelligence and machine learning algorithms, can help update repositories more efficiently, reducing administrative burden and human error. This solution could also facilitate interoperability with other systems and databases, improving the quality and usefulness of stored data.
- 3. Implement Data Governance Offices to strengthen data governance and develop internal capabilities in implementing technologies, particularly algorithm-related ones. Adequate data governance strategies at the government level strengthen internal capabilities in the design, implementation, and evaluation of algorithms.
- 4. Develop policies and standards for data management at the government level. Data governance offices should coordinate the implementation of data tools and technologies, foster a culture of data use throughout public administration, and assess and mitigate the risks associated with the use of algorithms; they are also key players when it is necessary to perform algorithm catalogues that allow organisations to understand and track the flow of data within the organisation and how it is transformed and used in different processes. Knowing how algorithms and data are used in an organisation sometimes reveals the first proactive registry implementation gap for algorithmic transfer.
- 5. Create financial and non-financial incentives for transparency to address the lack of resources. Financial and non-financial incentives could be implemented to motivate entities to register and maintain up-to-date information about their algorithms. This could include grants, tax benefits, or public recognition for organisations that commit to transparency and maintenance of repositories. This last point suggests the possibility of creating "Algorithmic Transparency Seals." This would allow companies and bodies using ADM systems in the public sector to stand out for their commitment to ethical and transparent AI. Creating specific funds to support algorithmic transparency, financed through public-private partnerships or specific taxes, could also be considered.



- 6. Develop and implement specific KPIs for algorithmic transparency. As part of the overall project objectives, specific KPIs could be developed to measure the impact of algorithmic repositories in defined areas related to achieving those objectives. These indicators could include metrics such as the number of algorithms registered, the number of visits or interactions, the number of subscribers to the repositories, data usage (where downloading of information or consumption via API is possible), the frequency of repository updates, user provenance, quality of descriptions and metadata, and citations to the repository. Establishing these KPIs will help identify areas for improvement and justify ongoing investments in algorithmic transparency. In this aspect, the Chilean repository that allows users to enter their feedback on the platform stands out.
- 7. Developing a dissemination strategy to maximise the repository's impact should incorporate a comprehensive dissemination strategy that includes creating high-quality content, active user participation, and collaboration with academic institutions and companies. In addition, it is essential to continuously monitor and evaluate the repository's performance to identify areas for improvement and adjust the strategy accordingly.
- 8. Clear language will always be a significant challenge in implementing algorithmic transparency mechanisms. The principal difficulties usually lie in the areas of descriptions and the logic of algorithmic operations, which can be quite technical or loaded with legal language.

Explanatory glossaries should be generated in any registry transparency initiative to assist in the proper description of the information fields. However, a glossary alone may not be enough and should not be the only thing to consider in terms of access and usability, as there are additional challenges in this regard.



# 4. Determining the appropriate instruments for algorithmic transparency

The choice of which algorithmic transparency tool a government should use is not a one-size-fits-all decision; it must be based on multiple factors, such as the impact of the algorithmic system, the types of users affected, the resources available, and the legal environment. To achieve effective transparency, governments may select a combination of **proactive (supply-driven)** and **reactive (demand-driven)** approaches, depending on the needs and characteristics of the system.

# 4.1. Proactive approach (supply-driven): Instruments that promote continuous transparency

**Proactive tools** provide information about algorithms on an ongoing and accessible basis without requiring a specific request from the public or regulatory bodies. These instruments are ideal when the goal is to ensure **long-term transparency** and create open and continuous access to relevant information about algorithms. The following are the main scenarios in which proactive tools should be implemented:

## 4.1.1 Public algorithm repositories

When to use them: Public algorithm repositories are critical when algorithms have a continuous and direct impact on citizens or public services. They should be used when algorithms influence administrative or public policy decisions that affect large segments of the population, such as in health, education, justice, or social security systems.

Why use them: Repositories enable public disclosure of detailed information about how algorithms work, what data they process, and what automated decisions they make. This approach promotes **accountability** and **explainability**, as citizens, regulators, and technical experts can access the details of algorithms without formal requests.

## 4.1.2 Periodicals and reports

When to use them: Periodic publications are appropriate when transparency is required that is less technical and more focused on the results of algorithm use. Some examples could be reports on the social, economic, or ethical impact of algorithms used in public administration.

Why use them: This tool is useful when you need to inform a broader audience that does not necessarily have deep technical knowledge. Regular reports provide an accessible way to publicize the overall impacts of algorithms on society, especially in areas where citizens need to be informed about equity, fairness, or the socioeconomic effects of automated decisions.

# 4.1.3 Automated responses based on interactions with users

When to use them: Automated responses should be used when algorithms interact directly with citizens and make automated decisions that affect their rights or access to public services. An example would be a social benefit allocation system, where citizens need to know the process and outcome of the decision in real-time.

Why use them: These tools enable immediate and personalised transparency, ensuring users understand how the algorithm arrived at a certain decision in their case. They also facilitate dynamic interaction with the system, allowing citizens to get clear answers tailored to their situation.

# 4.2. Reactive approach (demand-driven): Instruments that respond to transparency requests

**Reactive instruments** are implemented to provide transparency only when requested, either by citizens, regulators, or the judicial system. This approach is most appropriate when algorithms do not continuously impact citizens or transparency must be tailored to specific cases.

# 4.2.1 Responses to requests for information

When to use them: This tool should be used when transparency is needed in specific cases where citizens or entities are interested in understanding how an algorithm has affected their situation. It is helpful in contexts where the algorithm does not have a generalised but rather a significant impact in isolated cases or specific sectors.

**Why use them:** It provides a **personalised** and **bounded** response, allowing governments to efficiently respond to information requests without the need to disclose information about all algorithms in operation. This approach is ideal for situations where the volume of requests is manageable and does not require constant proactive transparency.

## 4.2.2 Court rulings requiring disclosure

When to use them: Court rulings are necessary when a citizen or group of citizens has filed a legal challenge requesting disclosure of information about how an algorithm affected their rights. In these cases, reactive transparency is not only limited to technical information about the algorithm but may also include the legal and ethical justification for the algorithm's use.

**Why use them:** Judicial resolutions are the last resort to ensure transparency when proactive or injunctive mechanisms have not been sufficient. They provide mandatory and complete transparency in cases where the integrity of citizen rights is at stake. These cases set important precedents that may force the government to implement better algorithmic transparency practices in the future.

# 4.3. Key Factors in determining the right approach and instrument

The selection of the appropriate approach depends on several key factors that governments should evaluate before choosing which instruments to use:

## 4.1.1 Nature of the algorithm and its impact

If the algorithm directly affects citizens in critical decisions (e.g., justice or health), a proactive approach is needed to ensure that citizens and regulators can access information without barriers.

If the algorithm has a limited impact or is used internally by the government, a reactive approach may be sufficient, responding only to specific requests.

# 4.1.2 Target audience

Algorithms that impact a technical or internal audience may benefit from tools that provide detailed technical explanations, such as specialised repositories or audits. In contrast, algorithms that impact a general audience may need more accessible explanations and periodic publications that communicate impacts in an understandable way.

## 4.1.3 Available resources

The financial and human resources available to maintain a high level of transparency also play a crucial role. Public repositories and periodic audits require a solid infrastructure and trained staff, so if resources are limited, opting for more reactive approaches or automated and efficient transparency tools may be preferable.

### 4.1.4 Legal and Regulatory Context

In some cases, local or international laws may require mandatory transparency through specific mechanisms, such as compliance with the **AI Act** in the European Union. Governments should ensure that the approach selected complies with applicable regulatory standards, even if this means adopting a proactive approach that goes beyond what was initially planned.

# 4.4. Practical examples

## Case 1: Government of Canada - Visa process

Canada uses automated responses to inform applicants about the status of their visa applications. This proactive approach allows applicants to understand the processing stages of their applications and any decisions made by the algorithm.

#### Case 2: European Union - Al Act

Under the AI Act, the European Union has established standards requiring public disclosure of high-risk algorithms. This is a clear example of a proactive approach that uses audits and public repositories to ensure transparency and accountability in systems impacting millions of citizens.

Based on the above, the choice between proactive and reactive approaches to algorithmic transparency depends on contextual factors such as the nature of the algorithm, its impact, the target audience, and available resources. While proactive approaches, such as algorithm repositories and audits, are essential for algorithms with a broad and ongoing impact, reactive approaches are more appropriate when transparency is required in isolated situations or in response to specific requests. Ultimately, governments must be flexible and use a combination of both approaches to ensure that the principles of transparency and accountability are effectively met.



# 4.5. Decision tree

#### Guiding Algorithmic Transparency decisions based on contextual factors

This decision tree (figure 2) was developed to help governments assess the appropriate type of algorithmic transparency required for various scenarios. Each step is designed to guide decision-makers through a structured process, considering the specific context in which the algorithm operates. The tree prompts key questions, such as whether the algorithm affects citizens' rights or is used for administrative efficiency, to determine the most suitable transparency approach —whether as a right, capability, principle, or obligation.

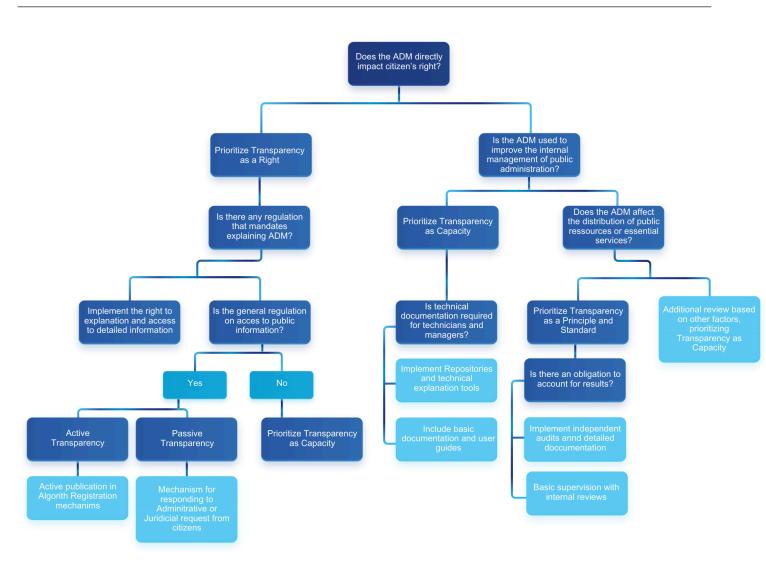
The decision-making tree is helpful because it ensures governments adopt a tailored approach to algorithmic transparency rather than a one-size-fits-all solution. By systematically considering the nature of the algorithm's impact, stakeholders can choose the right tools and methods, such as public repositories, explainability measures, or audits, to enhance transparency in a way that aligns with the goals and context of each scenario.

The decision tree is explained and justified in a structured manner:

- 1. **Contextual assessment**: The tree begins by asking questions that clarify the specific situation in which the algorithm is used.
- Decision points: Each branch addresses critical decision points, such as whether citizens' rights are affected or if the algorithm manages internal processes, helping to determine the appropriate type of transparency.
- 3. Selection of tools: Once the type of transparency is identified, the tree suggests appropriate tools, ensuring the decision-making process is pragmatic and aligned with the government's transparency objectives.

This systematic approach helps governments navigate complex scenarios with clarity, ensuring that transparency is applied most effectively in each context.

Proper selection of tools is a crucial step in ensuring the effectiveness of transparency policies in governments. Through a systematic process that takes into account the specific type of transparency sought to be implemented, the decision tree below provides recommendations on the most appropriate tools. This approach allows decision-makers to opt for the most appropriate solutions for each context, ensuring that transparency objectives are achieved in a way that is efficient and aligned with the government's needs.







Finally, the concept of transparency is fundamental in public management as it defines the degree to which citizens and other stakeholders can access relevant information about government decisions and activities, in this case public algorithms. In this sense, establishing a clear definition and standard for transparency is essential to assess its implementation and effectiveness. Through a benchmarking analysis, different transparency approaches and practices adopted are compared, allowing best practices to be identified, and more effective strategies to be adapted on a case-by-case

Transparency definition	Challenges	Weaknesses	Advantages
Capability	<ul> <li>Technical knowledge required for the public.</li> <li>Limited access to documentation.</li> <li>Investment in user education</li> </ul>	<ul> <li>Not all users can engage with technical details.</li> <li>Risk of transparency divide.</li> </ul>	<ul> <li>Empower citizens to engage and understand.</li> <li>Builds trust by providing technical explanations.</li> </ul>
Principle	•Ensuring fairness and non-bias is challenging.	<ul> <li>Requires constant audits and adjustments.</li> <li>Difficult to measure principles like fairness.</li> </ul>	<ul> <li>Ethical responsibility.</li> <li>Promotes fairness and equity in systems.</li> </ul>
Standard	<ul> <li>Resource-intensive to maintain documentation.</li> <li>Difficult to establish universal standards.</li> </ul>	<ul> <li>Lack of standardised practices.</li> <li>Complex audits.</li> </ul>	<ul> <li>Clear benchmarks for accountability.</li> <li>Facilitates regular oversight and performance reviews.</li> </ul>
Right	<ul> <li>Ensuring comprehension for citizens.</li> <li>Balancing transparency and privacy.</li> </ul>	<ul> <li>Complex legal frameworks for the right to explanation.</li> <li>Risk of continued opacity.</li> </ul>	<ul> <li>Direct citizen engagement.</li> <li>Enhances democratic accountability.</li> </ul>
Obligation/ Responsibility	<ul> <li>Coordination across government agencies is hard.</li> <li>Ensuring consistency in obligations.</li> </ul>	<ul> <li>Complex regulatory frameworks.</li> <li>Reliance on formal audits can miss subtle issues.</li> </ul>	<ul> <li>Clear legal and ethical transparency framework.</li> <li>Ensures accountability for government agencies.</li> </ul>

definition

Instruments	Challenges	rk: Transparency Instrume Advantages	Weaknesses
Online repositories of algorithms	•Lack of specific regulations and homogeneity.	<ul> <li>Increases openness and transparency of algorithmic processes.</li> </ul>	•Limits on protecting sensitive information. •Requires significant
	<ul> <li>Contextual limitations due to regional differences.</li> <li>Sustainability issues and lack of resources for upkeep.</li> <li>No standardised KPIs to measure effectiveness.</li> <li>Encapsulated for a specialised audience.</li> </ul>	<ul> <li>Fosters evaluation and accountability.</li> <li>Allows evidence-based impact analysis.</li> <li>Can set transparency standards and criteria.</li> </ul>	resources and continuous updates. •Still not fully accessible to the general public.
Responses to requests for information	<ul> <li>Delays in providing information.</li> <li>High costs to organisations.</li> <li>Limited by legal frameworks and jurisdictions.</li> </ul>	<ul> <li>Provides targeted transparency for individual cases.</li> <li>Enhances the public's right to request information.</li> </ul>	<ul> <li>Requires reactive, not proactive, transparency.</li> <li>Often lengthy and bureaucratic process.</li> <li>May exclude critical information, depending on legal limitations.</li> </ul>
Judge-ordered disclosure	•Legal action is required, which can be costly and time-consuming. •Disclosure is limited to legal contexts.	<ul> <li>Provides legally binding transparency.</li> <li>Ensures accountability and trust in judicial oversight.</li> </ul>	<ul> <li>Reactive rather than proactive.</li> <li>Limited scope and application outside the courtroom.</li> </ul>
Proactive user-driven postings	<ul> <li>Dependence on voluntary actions from the organisation.</li> <li>No legal enforcement mechanisms to ensure consistency.</li> </ul>	<ul> <li>Allows organisations to voluntarily disclose important algorithmic data.</li> <li>Can build public trust and legitimacy when done transparently.</li> </ul>	<ul> <li>Lacks enforcement; voluntary measures may not cover essential data.</li> <li>May lead to inconsistencies in reporting and transparency across different entities.</li> </ul>

#### Table 2: Benchmark: Transparency Instruments

Automated responses triggered by interactions	•Difficulty in maintaining up-to-date and accurate information. •Requires robust systems to trigger responses in real time.	<ul> <li>Provides immediate, real-time transparency for users interacting with a system.</li> <li>Enhances user trust by explaining decisions as they happen.</li> </ul>	<ul> <li>Limited scope; might not provide deep transparency on algorithm functioning.</li> <li>Requires significant technical resources to set up and maintain.</li> </ul>
Active publication of results of audits/evaluatio ns of ADMs	<ul> <li>Technical results can be hard for the public to understand without proper context.</li> <li>It may affect sensitive information.</li> <li>High costs to organisations.</li> </ul>	<ul> <li>Encourages public and expert participation in decision-making about ADMs.</li> <li>Promotes informed debate by raising public awareness of ADMs risks.</li> <li>Builds trust and legitimacy.</li> </ul>	<ul> <li>They may be too technical, limiting public understanding.</li> <li>Agencies may resist transparency, fearing criticism from publicised audit/evaluation results.</li> </ul>





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