

*Unlocking Public Sector AI*

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# AI Procurement in a Box: Project overview

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# Foreword



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The promises of artificial intelligence (AI) technologies are literally beyond the capacity of our imagination. The risks that accompany these developments are also impossible to predict. At this pivotal moment in the adoption of AI by governments globally, there is an opportunity to establish a set of actionable procurement guidelines to enable good decision-making that can also be evaluated.

Government procurement officials cannot be expected to have the most up-to-date knowledge in every highly specialized field. To safeguard the responsible future use of AI technologies, a multistakeholder effort with cross-sector participation and interdisciplinary expertise is required to create authoritative guidelines. The procedural norms are even more urgent now. What information should be recorded and how explanations need to be documented is what lays the foundation for fairness and impartiality in the administrative process. To preserve due process and predictability, a coalition can help ensure that the right questions are asked.

The Forum offers the *Procurement in a Box* package, a pragmatic guidebook to unlock public-sector adoption of AI through government procurement. This was the aspiration of our project. This work offers a set of complementary tools to demonstrate the emerging global consensus on the responsible deployment of AI technologies.

The Procurement in a Box project has taken shape at a time when the social contract between the government, its citizens, and their industries is suspended and is about to reset. The COVID-19 pandemic has further emphasized the imperative for responsible innovation and the ethical use of technology. We now know how vulnerable an interdependent world can be. Solving complex

societal problems with pattern recognition and predictive algorithms is an integral part of the new social contract.

The scenarios of how government may use AI technologies is already taking place. For example, chat bots are increasingly being used by government agencies to effectively manage overwhelming inquiries from the general public, but have also increased the concern that sensitive information about people may be misused in the future. Similarly, applying predictive policing to help manage law enforcement has helped fight crime, but has also exposed the bias and discrimination that are embedded in society.

Setting standards to obtain essential information and create cooperative relationships can have a profound impact on mitigating these harms. AI technologies demand special attention because automated processes amplify and propagate bias swiftly and these technologies are growing in prominence. The Procurement in a Box offers important guidance to help prepare for the future.

This project has helped identify useful mechanisms to inform technology policy in the Fourth Industrial Revolution. Shaping the norms for AI procurement in the public sector will significantly influence best practice in the rest of the market and throughout the industry. The recommendations and supporting material in this package are intended to be put into practice. The resources are available publicly as a “living document” to encourage wide adoption as well as ensure the guidelines evolve with insights from a range of trials.

The Forum looks forward to continuing to work together to keep AI technologies and their use responsible and ethical.

## 2

# Introduction

## 2.1 What is *AI Procurement in a Box*?

*AI Procurement in a Box* is a practical guide that helps governments rethink the procurement of artificial intelligence (AI) with a focus on innovation, efficiency and ethics. Developing a new approach to the acquisition of emerging technologies such as AI will not only accelerate the adoption of AI in the administration, but also drive the development of ethical standards in AI development and deployment. Innovative procurement approaches have the potential to foster innovation, create competitive markets for AI systems and uphold public trust in the public-sector adoption of AI.

AI has the potential to vastly improve government operations and meet the needs of citizens in new ways, ranging from intelligently automating administrative processes to generating insights for public policy developments and improving public service delivery, for example, through personalized healthcare. Many public institutions are lagging behind in harnessing this powerful technology because of challenges related to data, skills and ethical deployment.

Public procurement can be an important driver of government adoption of AI. This means not only ensuring that AI-driven technologies offering the best value for money are purchased, but also driving the ethical development and deployment of innovative AI systems. Government as a powerful market player can set standards when it comes to the ethical development of technologies and

has done so in cybersecurity and cloud policy in recent decades. Public procurement has been shown to deliver strategic goals in areas such as environment and human rights and offers an attractive tool for policy-makers to address wider societal issues. Nevertheless, it is not straightforward and careful development of processes and incentives need to be considered to achieve strategic maturity of commercial actions.

These actions are more important than ever when it comes to the adoption of AI. Failure to promote ethical and technically robust considerations, diversity and openness through AI procurement may also lead to poor procurement decisions for AI systems. This can limit accountability, undermine social values, entrench the market power of large businesses, decrease public trust and ultimately slow digital transformation in the public sector.

To help governments unlock the potential of AI in the public sector the World Economic Forum's Centre for the Fourth Industrial Revolution in collaboration with the Government of the United Kingdom, Deloitte and Splunk has created *AI Procurement in a Box*. This practical guide helps policy-makers and commercial teams rethink their approach to AI procurement to more effectively and ethically adopt AI technologies in the public sector.

The guide includes:

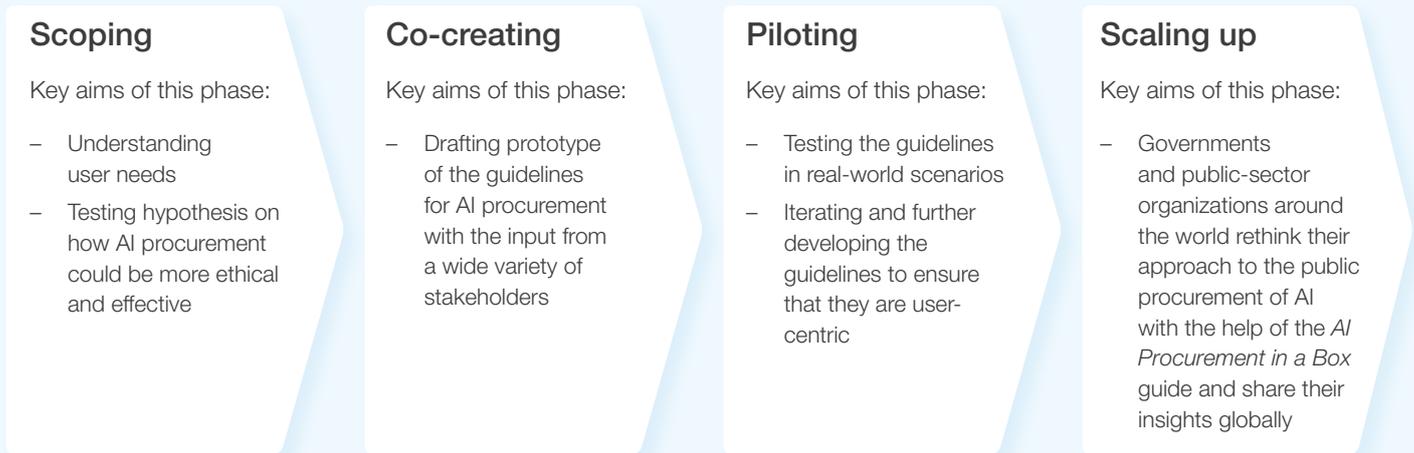
	<b>Module</b>	<b>Principles</b>	<b>Purpose</b>
01	<a href="#">Guidelines for government AI procurement</a>	These are principle-based guidelines for AI procurement presenting the general considerations to be taken when procuring AI-powered solutions.	The guidelines are an introduction to the most important topics that need to be addressed when reconsidering the approach to AI procurement. They aim to help reshape public procurement in the context of AI and are the building blocks of the guide.
02	<a href="#">Workbook for policy and procurement officials</a>	The workbook includes a selection of instruments and templates that sit alongside the guidelines.	This is a summary of tools that aims to help users with actively rethinking the approach to AI procurement.
a	<b>Risk assessment</b>	Example decision criteria for conducting an AI project risk assessment.	This assessment can be a useful basis to develop a proportionate approach to AI procurement. Depending on the use case the issues needed to be considered can vary.
b	<b>User manual</b>	A set of questions that highlight the main considerations that users should be able to address when implementing the guidelines.	The questions seek to direct users through the guidelines and prepare them for implementation.
c	<b>AI specification and evaluation tool</b>	Examples of requirements to include in an RFP and examples of robust practices to look out for when evaluating RFP responses.	This should help procurement teams to draft the RFP specification and evaluate the tender responses.
d	<b>Workshop slide pack: How to kick-off the implementation</b>	A slide pack summarizing the agenda, content and facilitation ideas for guidelines implementation workshops.	This workshop template gives ideas to workshop facilitators on how to best design multi-stakeholder workshops for the implementation of the guidelines.
e	<b>Case studies</b>	A selection of examples from government and private-sector actors who have procured AI previously.	These examples seek to inspire public- and private-sector actors to reconsider the way they are procuring AI technologies.
03	<a href="#">Challenges and opportunities during implementation</a>	This document is an overview of the findings from workshops conducted in Bahrain, the UAE and the UK, which focused on translating the guidelines from theory into practice.	The workshop insights provide users with an overview of the themes and important aspects to consider when implementing the guidelines.
04	<a href="#">Pilot case studies from the United Kingdom</a>	This document summarizes and analyses the pilot of the guidelines carried out in the UK.	The lessons learned are designed to provide helpful tips for other organizations seeking to use the guidelines.

## 2.2 How did we get here?

The Centre for the Fourth Industrial Revolution is a global hub of expertise, knowledge-sharing and collaboration, based in San Francisco. The Centre develops, pilots and scales up agile and human-centred governance tools that can be adopted by policy-makers, legislators and regulators worldwide to address challenges related to emerging technologies.

Together with more than 200 stakeholders from government, academia, the third sector and business, the Centre created the *AI Procurement in a Box* during the course of 15 months.

FIGURE 1 Project phases



### Scoping

The team started by exploring the challenges to government procurement. After two workshops in San Francisco and London and

following extensive consultation with experts worldwide, five key challenges to government procurement of AI were identified.

FIGURE 2 Challenges to government procurement of AI technologies



The lack of data sharing and data governance in the public sector often leads to a lack of data availability discoverability and usability. Since data is currently often the basis of any AI development, these challenges are a great barrier to AI adoption. The team also discovered that sector officials may lack the appropriate knowledge and expertise to make strategic buying decisions for AI-powered solutions. Uncertainty about ethical considerations adds further layers of complexity. As a result,

officials tend to delay buying decisions or reduce perceived risk by purchasing solutions from large and well-known suppliers. For a more detailed description of the main roadblocks see here.

To address these challenges, the team agreed to develop an overview of the important drivers of more effective ethical public procurement and ideas for policy-makers as to how to incorporate these into action.

## Co-creating

The team drafted the procurement principles, which included the findings from the workshops, consultations and input from more than 100 stakeholders from business, academia and government. Comments were facilitated through webinars, community calls, roundtables and workshops, for example with 30 senior commercial specialists from Central and Latin America hosted by the Inter-American Development Bank.

The aim of the guidelines is to maximize the value of data while also setting the highest standards for transparency and accountability when buying new

AI and machine learning (ML) technology. Enhanced procurement processes help promote the use of AI and ML, giving the public sector more tools to develop the economy and better serve the public.

The guidelines also inform suppliers about the technical and ethical requirements of public-sector bodies related to these technologies. They aim to address specific business needs from the public and private sector as well as to support public trust in the government adoption of AI. Overall this should lead to more efficient, responsible and sustainable outcomes for the public and private sectors.

## Piloting and iterating

During the pilot phase the procurement guidelines were used by teams in the United Kingdom's Department for Business, Energy and Industrial Strategy and the Food Standards Agency (see pilot report for more detail) and facilitated workshops in Bahrain, the UAE and the UK to test them with government leaders (see key insights for the workshops [here](#)).

It became clear that practical tools are needed to tailor the guidelines to national contexts. The

principle-based guidelines are useful to introduce the key concepts, but more work is needed to implement them in different jurisdictions. Therefore, the team created a workbook that sits alongside the AI procurement guidelines. It aims to provide government officials and industry with greater clarity on their purpose and enable them to embed the guidelines into their procurement considerations. The workbook aims to bring the guidelines to life and provide practical guidance into all issues that they raise.



## 2.3 How do you use the *AI Procurement in a Box*?

The *AI Procurement in a Box* guide will help governments and public-sector organizations to start rethinking their approach to the public procurement of AI technologies. When developing the guide, the team took a module-based approach, at the heart of which the guidelines for AI procurement sit. It is recommended that users of the guide follow a step-by-step approach to implementing the guidelines.

Users of the *AI Procurement in a Box*:

- Governments that aim to accelerate AI adoption in a safe, ethical and innovative manner
- Policy officials to accelerate attainment of their policy goals
- Procurement officials and commercial teams to develop AI-related requests for proposals and to manage procurement processes
- Data practitioners and technology experts (e.g. statisticians, data scientists, digital delivery managers) to safeguard public benefit and identify and manage potential risks
- AI-solutions providers to better understand the core expectations for government AI projects and to align their proposals with emerging standards for public procurement

Any institution or government that aims to adopt the guidelines in an incremental manner and to drive strategic change by involving actors from throughout the organization should follow these stages described below:

### Learn

Facilitate internal and external multistakeholder discussions into what AI is and review the opportunities and risks of AI. Provide specific examples of how AI is currently already used in the public sector and gather best practices and case studies for AI adoption from other organizations worldwide.

### Review

Study the guidelines and consider the case studies that can offer you insights into how other organizations have procured AI technologies.

### Discover

Explore your current procurement practices and compare them with the approach described in the guidelines.

### Tailor

Match the guidelines with your current processes and develop a new approach to procurement that you test in different scenarios. Learn from the pilots and further develop the tools in the *AI Procurement in a Box* guide to ensure user-centric guidance for your procurement teams.

### Implement

Share the insights from the pilots and complete the adoption of new processes and standards.

How these stages play out in practice will most likely vary from organization to organization and from country to country, as well as depend on factors like maturity of AI adoption and organizational structures. Nevertheless, implementation methods that focus on multistakeholder discussions and the development of a coherent strategy are recommended. A good starting point is to hold workshops and round tables in collaboration with AI experts and developers, including but not limited to, consultancies, prominent IT service providers, start-ups, universities, research institutes and citizen rights organizations.

Please get in touch with your insights once you've trialled this guide: [ai@weforum.org](mailto:ai@weforum.org)

# Acknowledgements

The World Economic Forum's Unlocking Public Sector Artificial Intelligence project, in collaboration with the Government of the United Kingdom, Deloitte Consulting and Splunk is a global, multistakeholder and cross-disciplinary initiative intended to help shape the public sector's adoption of AI, and emerging technologies in general, around the world. The project has engaged leaders from

private companies, governments, civil society organizations and academia to understand public-sector procurement of AI technology, identify challenges and define principles to guide responsible and ethical procurement. The opinions expressed herein may not correspond with the opinions of all members and organizations involved in the project.

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# AI Procurement in a Box: AI Government Procurement Guidelines

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1

# What is artificial intelligence (AI)?

AI has been formally defined as “technologies [that] aim to reproduce or surpass abilities (in computational systems) that would require ‘intelligence’ if humans were to perform them. These include: learning and adaptation; sensory understanding and interaction; reasoning and planning; optimization of procedures and parameters; autonomy; and creativity.”<sup>1</sup>

New AI approaches developed in the past decade, particularly the use of deep-learning neural networks, have dramatically advanced the capability of AI to recognize complex patterns, optimize for specific outcomes and make automated decisions. Doing this requires massive amounts of relevant data, a strong algorithm, a narrow domain and a concrete goal, and can result in dramatic improvements in reliability, efficiency and productivity.



2

# Why do we need guidelines for public procurement of AI?

🗣️ **New examples are emerging of negative consequences arising from the use of AI in areas such as criminal sentencing, law enforcement and even employment opportunities.**

Governments are increasingly seeking to capture the opportunities offered by AI to improve public-sector productivity and the provision of services to the public, and to stimulate the economy. AI holds the potential to vastly improve government operations and meet the needs of citizens in new ways, ranging from traffic management to healthcare delivery to processing tax forms. However, governments often lack experience in acquiring modern AI solutions and many public institutions are cautious about harnessing this powerful technology. Guidelines for public procurement can help in a number of ways.

First, government and the general public have justified concerns over bias, privacy, accountability, transparency and overall complexity. New examples are emerging of negative consequences arising from the use of AI in areas such as criminal sentencing, law enforcement and even employment opportunities. As citizens increasingly demand the same level of service from their governments as they do from innovative private-sector companies, public officials will be required not only to identify the specific benefits AI can bring, but also to understand the negative outcomes that can be generated.

Governments do not have the latitude of using the inscrutable “black box” algorithms that increasingly characterize AI deployed by industry. Without clear guidance on how to ensure accountability, transparency and explainability, governments may fail in their responsibility to meet public expectations of both expert and democratic oversight of algorithmic decision-making and may inadvertently create new risks or harms.

Governments rely on the expertise, and previously developed models, of technology providers and may lack the necessary skills to fully understand or trace algorithmic causality. Technology providers understand these challenges and look to governments to create clarity and predictability about how to manage them, starting in the procurement process. While companies are generally wary of stricter guidelines for government procurement, common-sense frameworks can help governments overcome reluctance to procure complex new technologies and actually open new markets for companies. Transparent guidelines will permit both established companies and new entrants to the AI space to compete on a level playing field for government contracts.

Second, AI procurement can build on a foundation of previous efforts to improve the effectiveness and efficiency of government technology procurement or be integrated into existing efforts. These may include legislation or policy measures such as frameworks or model contracts.

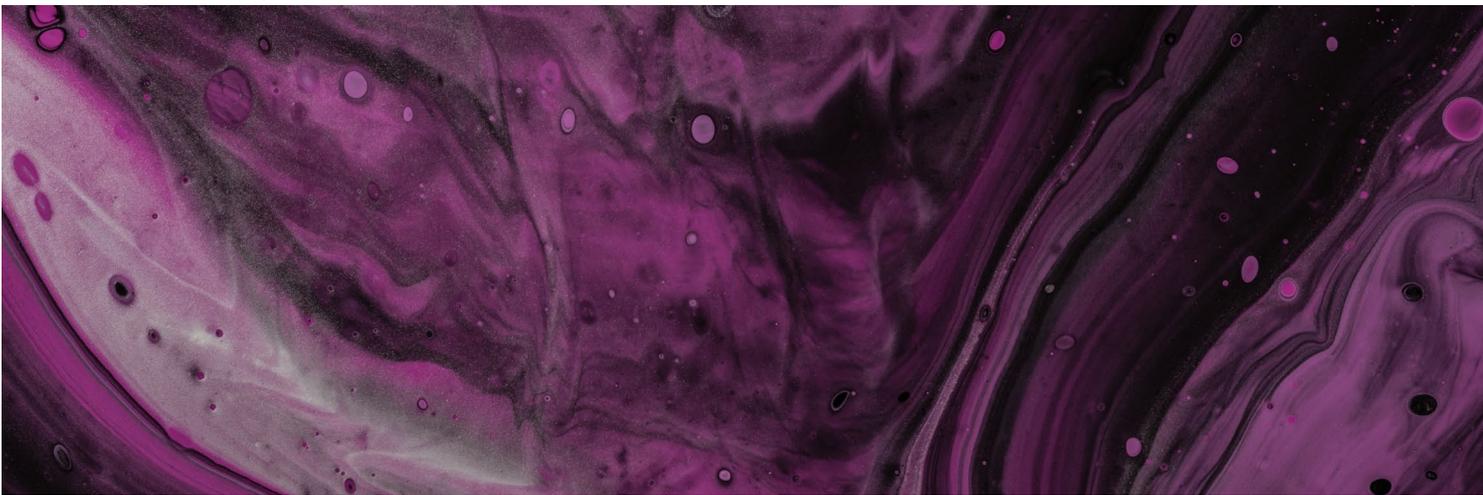
Established principles of good government technology procurement may take on added significance in AI procurement. For example, many governments already ensure that procurement efforts are run by multidisciplinary teams. Experience has shown that a lack of diversity in AI teams and positions of leadership has correlated with inadvertent harms or discrimination to vulnerable minority groups and protected classes. Given government’s role in upholding inclusion, an added emphasis on a multidisciplinary approach and diversity may be necessary in AI procurement.

Some of the elements highlighted in the guidelines might already be evaluated in existing governance approaches but are not brought together holistically for decision-making. Closer working relationships between different teams should simplify the review of governance processes of AI systems even if they happen throughout different governance bodies and should integrate them in a strategy for AI adoption.

Third, as noted, AI has advanced rapidly in recent years, spurring further research and applications. New uses of AI that are of interest to governments will continue to emerge and will bring with them both benefits and risks. It is important that governments prepare for this future now by investing in building responsible practices for how they procure AI.

Finally, government procurement rules and purchasing practices often have a strong influence on markets, particularly in their early stages of development. As industry debates setting its own standards on these technologies, the government's moral authority and credibility can help set a baseline for these discussions.

Overall, the guidelines aim to guide all parties involved in the procurement life cycle – policy officials, procurement officers, data scientists, technology providers and their leaders – towards the overarching goal of safeguarding public benefit and well-being.



3

## How were these guidelines developed?

The guidelines were developed by the World Economic Forum Centre for the Fourth Industrial Revolution, in consultation with a multistakeholder community. Project fellows from the UK Government's Office for AI, Deloitte and Salesforce worked with Forum staff, and in partnership with Splunk-convened workshops with appropriate representatives from government, academia, civil society and the private sector to explore key issues and co-design responses.

## 4

# How to use the guidelines

The guidelines provide fundamental considerations that a government should address before acquiring and deploying AI solutions and services. They apply once it has been determined that the solution needed for a problem could be AI-driven. The guidelines are not intended as a silver bullet for solving all public sector AI-adoption challenges, but by influencing how new AI solutions are procured, they can set government use and adoption of AI on a better path.

**Specifically, the guidelines will help:**

- Policy officials to accelerate attainment of their policy goals
- Procurement officials and commercial teams to develop AI-related requests for proposals and to manage procurement processes

- Data practitioners (e.g. statisticians, data scientists, digital and technology experts) to safeguard public benefit and identify and manage potential risks
- AI-solutions providers to better understand the core expectations for government AI projects and to align their proposals with emerging standards for public procurement

The guidelines consist of 10 high-level recommendations, ordered roughly sequentially in terms of their relevance to the cumulative process of procurement, each containing:

- Multiple principles relating to each guideline
- Explanatory text elaborating on the thinking and substance underlying each principle

🔗 This increases the risks and sensitivities about AI deployment in many use cases.

It is important to approach AI procurement proportionality and not all guidelines may apply to the same extent to all procurement decisions. This is also why it is crucial to conduct an initial AI impact assessment and then act appropriately and proportionally.

Important issues that can drive your decision whether to add additional ethical criteria to consider within your procurement approach, can fall within the following categories, many of which are closely interlinked. Note that this is not an exhaustive list of issues that need to be considered nor does it give you the answers whether your AI project might be more or less risky but it highlights key areas that need to be investigated further, particular in a public sector context.

### Key variables to consider in a risk assessment:

#### Data:

- **Data sensitivity** – The more sensitive the data that you are using within the AI system is, the more checks you should be building in. You need to closely consider if the data could be re-identified or give away any personal information.
- **Data quality** – The less sure you are about the quality of your data, the better it is to build in additional assurances to avoid bias and de-risk the project. Ensuring the representativeness of the data set might be difficult to ensure and qualitative measures might need to be taken. It is important to consider specific societal bias that could be reflected in the data for public sector use cases.
- **Data consent** – If meaningful personal data consent in the context that you are planning to use an AI-driven solution is not clear, the project is considered riskier. Also ensure that you are not inferring consent to a certain use of the data that does not comply with the original use case.

#### Field of use:

- **Public scrutiny** – If the project is within a sector of intense public scrutiny because of privacy concerns, legal concerns, interest and/or frequent litigation, the stakes are also higher. Fields, among others, such as health, social assistance, employment, financial services, insurance, the criminal justice systems, immigration, access and mobility, or decisions about permits and licences are examples of areas of applications that demand further considerations.

#### Socioeconomic impact:

- **Stakeholders involved** – The higher the impact on individuals, businesses, and

communities, the more important it gets to thoroughly consider AI ethics and scrutinize the application of AI.

- **Scope of impact** – It is important to consider factors such as how many people are impacted; how high the impact is and how high the likelihood of impact is. The risk also increases when decisions of the systems are linked to groups of people that are particularly vulnerable.

#### Financial consequences for agency and individuals:

- **Scope of financial impact** – The higher the potential financial consequences, the more you should address all areas linked to AI specific considerations.
- **Types of financial impact** – The financial consequences can be diverse and include monetary aspects as well as the access to credit, economic opportunities, schooling or training, insurance and certifications.

#### Impact of the AI system on your processes, employees and core businesses:

- **Core functions impact** – If the AI system is central to the core function of the agency, you should take on a more mandated approach to not only mitigate technical risks but also for reputational risk. The more tech dependence you create the riskier.
- **Business functions impact** – Consider whether you are replacing a business function rather than just improving and adding to the status quo, this might also impact your decision on how much to scrutinize the procurement process.
- **Job loss** – the more processes are automated, the more job losses can be expected. This increases the risks and sensitivities about AI deployment in many use cases.
- **Human in the loop** – The less checks and balances you have in place, the more risk. You should focus on adding explainability, interpretability and mindful friction to your AI deployment.

#### Example of tools that are already used within the public sector and the risks attached to this adoption:

- **Spam-filters in email programs** – designed to detect and block unwanted emails. Have the least risk prone use of AI in the public sector but can lead to discrimination if certain email addresses are blocked. However, “human in the loop” is usually included at various junctions so that the program isn’t

making decisions completely on its own, thus easily mitigating risk.

- **AI in cybersecurity solutions** – designed to protect networks, programs, and data from attack, damage, or unauthorized access. At first sight less prone to risks related to AI ethics, but we need to closely consider how the system is used in practice. If AI is used to better predict threats or identify cyber security risks, thus in a supporting function rather than making specific decisions, this use case seems to have a lower risk profile and thus would demand a less stringent approach to the implementation of all parts of the guidelines.
- **Chatbots** – designed to converse with people via voice interfaces or text messages. If they mainly provide information back to you and make it easier to sort through a large amount of data, rather than driving decisions, the use case seems to be less risk prone. But since they will likely be built into key processes and will have citizens interact with them, it is advised to follow the AI procurement guidelines to support those purchases.
- **Fraud detection** – designed to detect, prevent and manage fraudulent patterns in the data. Well tested use case of AI in the public sector, allows departments to make more effective enforcement decisions but the risk can be high if data quality is poor and if vulnerable groups are over proportionally targeted. False positive can also have high financial consequences and data sensitivity can be high depending on the use case. Hence, AI procurement guidelines should be followed.
- **AI in policing or social services** – designed to support and/or drive decisions in fields such as law enforcement, crime prevention, public safety, children welfare, social programs. The use of AI in those fields involves large risks as policy decisions are built into those systems and socioeconomic impacts are high. These use cases need to be put under particular scrutiny and procurement decisions need to follow very clear rules that include system testing, ethical considerations and a great focus on data governance. AI procurement guidelines should be closely followed.
- **AI in HR** – designed to take on key HR tasks including hiring, retaining talent, training, benefits and employee satisfaction. Employment decisions have high stakes with critical

consequences for individuals, organizations and society. Algorithms can make predictions in ways that disadvantage certain groups. Hence, concerns about AI algorithms bias and discrimination are particularly heightened, further complicated by labour and anti-discrimination laws. Finally, unique aspects of the human resources setting, including small datasets, complex social interactions, data privacy concerns and the need for accountability pose challenges and require close procurement guidelines governance.

#### Examples on how to do this:

1. **AI risk assessment tool:** The tool aims to help you decide on a proportional approach to AI procurement. It sets out examples for decision criteria to include in a risk assessment of any potential solutions that contain AI capabilities. The tool outlines some of key questions you should consider when deciding your procurement strategy, considering what questions to ask in your RFP and assessing a solution.
2. **Alan Turing Institute, Understanding artificial intelligence ethics and safety:** This guide is an end-to-end guidance on how to apply principles of AI ethics and safety to the design and implementation of algorithmic systems in the public sector. The ethical platform includes; a list of values that orient you in deliberating about the ethical permissibility and impact of a prospective AI project; a set of principles that all members of your project delivery team should be well-acquainted with and a framework that operationalizes these values and principles in an end-to-end workflow governance model.
3. **Canadian directive on automated decision-making:** The Canadian government has developed a risk-based approach to AI adoption in the public sector which divides the AI systems in different levels. The four factors used to determine the risk-level are impact on: the rights of individuals or communities, the health or well-being of individuals or communities, the economic interests of individuals, entities, or communities and the ongoing sustainability of an ecosystem. Based on the risk-level, the guide provides insights on how to best approach AI procurement from a proportionality view and to what extent each requirement should be applied. Please refer to figure 1.

FIGURE 1 **Canadian Directive on Automated Decision-Making**

Level	Description
01	<p>The decision will likely have little to no impact on:</p> <ul style="list-style-type: none"> <li>– The rights of individuals or communities.</li> <li>– The health or well-being of individuals or communities.</li> <li>– The economic interests of individuals, entities, or communities.</li> <li>– The ongoing sustainability of an ecosystem.</li> </ul> <p>Level 01 decisions will often lead to impacts that are reversible and brief.</p>
02	<p>The decision will likely have moderate impacts on:</p> <ul style="list-style-type: none"> <li>– The rights of individuals or communities.</li> <li>– The health or well-being of individuals or communities.</li> <li>– The economic interests of individuals, entities, or communities.</li> <li>– The ongoing sustainability of an ecosystem.</li> </ul> <p>Level 02 decisions will often lead to impacts that are likely reversible and short-term.</p>
03	<p>The decision will likely have high impacts on:</p> <ul style="list-style-type: none"> <li>– The rights of individuals or communities.</li> <li>– The health or well-being of individuals or communities.</li> <li>– The economic interests of individuals, entities, or communities.</li> <li>– The ongoing sustainability of an ecosystem.</li> </ul> <p>Level 03 decisions will often lead to impacts that can be difficult to reverse, and are ongoing.</p>
04	<p>The decision will likely have very high impacts on:</p> <ul style="list-style-type: none"> <li>– The rights of individuals or communities.</li> <li>– The health or well-being of individuals or communities.</li> <li>– The economic interests of individuals, entities, or communities.</li> <li>– The ongoing sustainability of an ecosystem.</li> </ul> <p>Level 04 decisions will often lead to impacts that are irreversible, and are perpetual.</p>

As the technological sophistication and government use of AI evolves, the guidelines should be updated to reflect new learning and leading practices. This is a living document that is intended to integrate feedback from practitioners over time. Much of that feedback will come from two sources: the project’s community of subject matter experts, and the pilots to be held with the UK, the United Arab Emirates, Colombia and other partner governments. We also

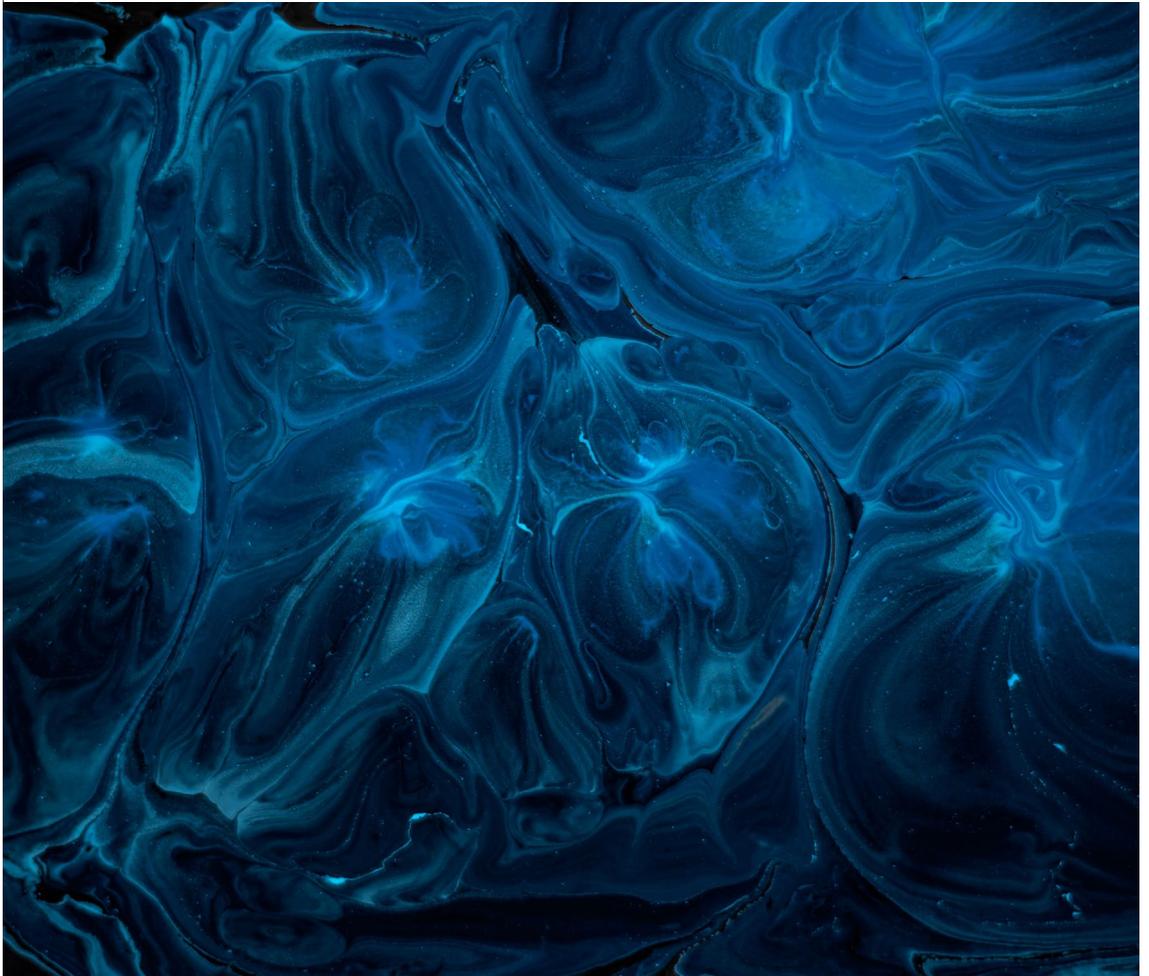
welcome feedback from other stakeholders and the general public. If you wish to provide feedback, please share via email: [AI@weforum.org](mailto:AI@weforum.org).

Ultimately, the goal is that these guidelines will enable governments and international bodies to set the right policies, protocols and perhaps even standards to facilitate effective, responsible and ethical public use of AI.

5

## Guidelines overview

What are the key considerations when starting a procurement process, writing a request for proposal (RFP), and evaluating RFP responses?



## Guideline

## Principles

**01** Use procurement processes that focus not on prescribing a specific solution but rather on outlining problems and opportunities, and allow room for iteration.

- a. Make use of innovative procurement processes to acquire AI systems.
- b. Focus on developing a clear problem statement, rather than on detailing specifications of a solution.
- c. Support an iterative approach to product development.

**02** Define the public benefit of using AI while assessing risks.

- a. Set out clearly in your RFP why you consider AI to be relevant to the problem and be open to alternative technical solutions.
- b. Explain in your RFP that public benefit is a main driver of your decision-making process when assessing proposals.
- c. Conduct an initial AI risk and impact assessment before starting the procurement process, ensure that your interim findings inform the RFP, and revisit the assessment at decision points.

**03** Align your procurement with relevant existing governmental strategies and contribute to their further improvement.

- a. Consult relevant governmental initiatives such as AI national strategies, innovation and/or industrial strategies, and guidance documents informing public policy about emerging technologies.
- b. Collaborate with other relevant government bodies and institutions to share insights and learn from each other.

**04** Incorporate potentially relevant legislation and codes of practice in your RFP.

- a. Conduct a review of relevant legislation, rights, administrative rules and other relevant norms that govern the types of data and kinds of applications in scope for the project and reference them in the RFP.
- b. Take into consideration the appropriate confidentiality, trade-secret protection, and data-privacy best practices that may be relevant to the deployment of the AI systems.

**05** Articulate the technical and administrative feasibility of accessing relevant data.

- a. Ensure that you have proper data governance mechanisms in place from the start of the procurement process.
- b. Assess whether relevant data will be available for the project.
- c. Define if and how you will share data with the vendor(s) for the procurement initiative and the subsequent project.
- d. Ensure that you have the required access to data used and produced by the vendor(s) solution.

## Guideline

## Principles

06

Highlight the technical and ethical limitations of intended uses of data to avoid issues such as historical data bias.

- a. Consider the susceptibility of data that could be in scope and if usage of the data is fair.
- b. Highlight known limitations (e.g. quality) of the data in the RFP and require tenderers to describe their strategies on how to address these shortcomings. Have a plan for addressing relevant limitations that you may have missed.

07

Work with a diverse, multidisciplinary team.

- a. Develop ideas and make decisions throughout the procurement process in a multidisciplinary team.
- b. Require the successful bidder(s) to assemble a team with the right skill set.

08

Focus throughout the procurement process on mechanisms of algorithmic accountability and of transparency norms.

- a. Promote a culture of accountability across AI-powered solutions.
- b. Ensure that AI decision-making is as transparent as possible.
- c. Explore mechanisms to enable interpretability of the algorithms internally and externally as a means of establishing accountability and contestability.

09

Implement a process for the continued engagement of the AI provider with the acquiring entity for knowledge transfer and long-term risk assessment.

- a. Consider during the procurement process that acquiring a tool that includes AI is not a one-time decision; testing the application over its lifespan is crucial.
- b. Ask the AI provider to ensure that knowledge transfer and training are part of the engagement.
- c. Ask the AI provider for insights on how to manage the appropriate use of the application by non-specialists.

10

Create the conditions for a level and fair playing field among AI solution providers.

- a. Reach out in various ways to a wide variety of AI solution providers.
- b. Engage vendors early and frequently throughout the process.
- c. Ensure interoperability of AI solutions and require open licensing terms to avoid vendor lock-in.

## 6

# Detailed explanation of guidelines

## 6.1 Use procurement processes that focus not on prescribing a specific solution, but rather on outlining problems and opportunities and allow room for iteration.

### Why is it important?

To acquire the AI systems that best address the challenge you want to address and encourage responsible innovation.

#### a. Make use of innovative procurement processes to acquire AI systems.

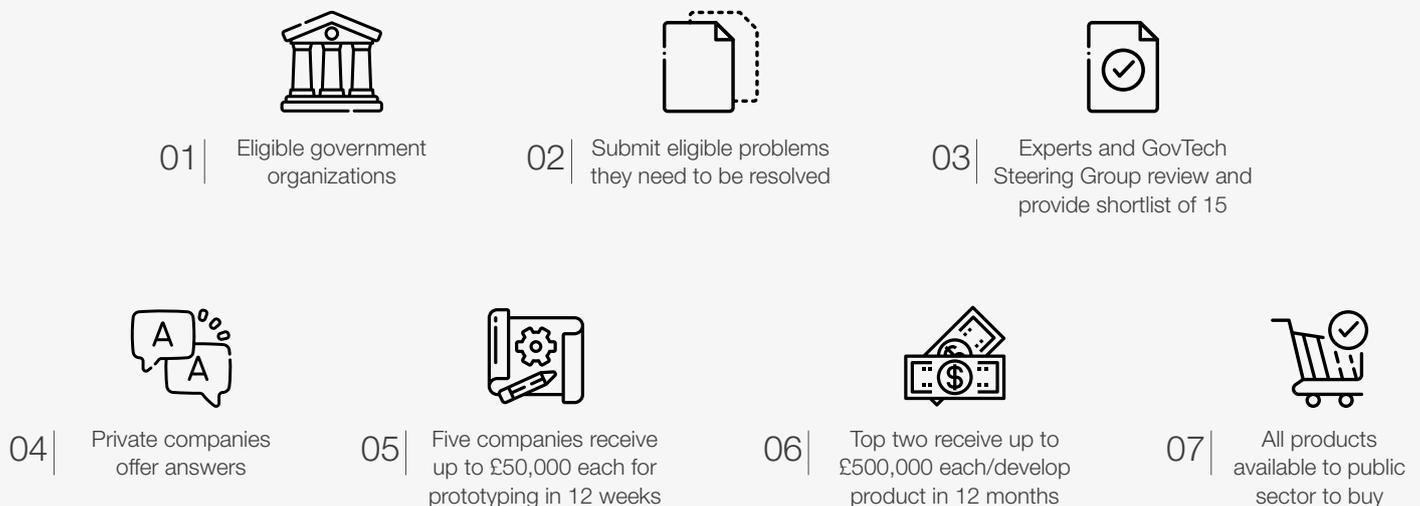
- Innovation-oriented procurement procedures provide opportunities to accelerate the adoption of new technologies such as AI systems, to promote innovation and to support secondary policy criteria such as support for small and medium-sized enterprises and the ethical development of AI.
  - For example, these processes support early market engagement, enable you to go to market in different stages and can include the use of proofs of concept. These provide the opportunity to test the technologies on your problem area before making a final buying decision. Innovative public procurement processes that include practices such as detailing challenging problems, organizing technology contests, providing opportunities for demonstrators, and giving newly established providers the opportunity to compete for public-sector contracts, have the potential to boost innovation and help new companies become established. This market-making role also encourages small enterprises with new ideas and reduces the risks for new technology start-ups.
- By strategically choosing the procurement approach depending on the nature of the challenge that you mean to address, these processes could include, for example:
    - Agile procurement processes that allow you to go to market in different stages and can include proofs of concept to test the technologies before the final purchase.
    - Challenge-based procurement processes that have vendors compete against each other based on their AI skills and include an evaluation of the technologies applied to the challenges they mean to address.
  - Innovation partnerships that enable the procurement of technologies that cannot be delivered by the current options available to the market.
  - Dynamic purchasing systems – procedures currently used mainly for products commonly available on the market – can accelerate uptake of technologies that are rapidly developing. As

“ Encouraging collaboration between different bidders.

- a procurement tool, it is similar in some ways to an electronic framework agreement but, as new suppliers can join at any time, this allows newly established firms to participate in the framework agreements when they meet the set criteria.
- AI procurement frameworks that prescribe the terms and conditions applying to any subsequent contract and allow the pre-vetting of providers against a set of predefined criteria that can include ethical requirements.
  - When making use of novel approaches to procuring emerging technologies you should also focus on best practices that have been shown to increase the supplier base of smaller and innovative suppliers, which is important for fast-developing markets such as AI. These practices include, but are not limited to:
    - Setting out and following a detailed procurement timeline at the start of the campaign.
    - Breaking down large proposals into smaller work components.
    - Encouraging collaboration between different bidders.
- b. Focus on developing a clear problem statement, rather than on detailing the specifications of a solution.**
- AI technologies are developing rapidly, with new technologies and products constantly being introduced to the market. By focusing on describing the challenges and/ or opportunities that you want to address and drawing on the expertise of technology partners, you can better

- decipher what technology is most appropriate for the issue at hand. By focusing on the challenge and/or opportunity, you might also discover a higher-priority issue, or realize you were focusing on a symptom rather than the root cause.
- Beyond playing to each stakeholder’s strength, this approach has two added benefits. First, it demands and promotes early market engagement, which we explain in further detail in Guideline 10. Second, it makes it easier for newer AI service providers (such as start-ups) to participate, as the government will not be focused on a specific product. Nurturing an emerging AI ecosystem is a key economic investment in the future.
- c. Support an iterative approach to product development.**
- AI-powered solutions differ significantly from other technology tools in their unique ability to learn and adapt through ongoing, periodic training with new data. Therefore, the procurement process should allow room for iteration, while ensuring a robust, fair and transparent evaluation and decision process.
  - For example, a phased challenge-based procurement could serve to evaluate different competitors’ minimum viable products (MVPs) during phase one of procurement, with only the winner going on to develop the full solution. This building and testing in phases within the procurement cycle facilitates informed decision- making, innovation and transparency. It also provides you with relevant information to conduct meaningful impact assessments and evaluate risks.

FIGURE 2 Visual to depict the challenge-based procurement process used by the UK GovTech Catalyst challenge



## 6.2 Define the public benefit of using AI while assessing risks.

🔗 What do you expect such a system to achieve and be capable of, and what are the types of failure and harm that must be avoided?

### Why is it important?

Defining the public benefit goal provides an anchor for the overall project and procurement process that the AI is intended to achieve. AI also brings new and specific risks that must be identified and managed as early as the procurement phase of the project.

#### a. Set out clearly in your RFP why you consider AI to be relevant to the problem and be open to alternative technical solutions.

- In most circumstances, you should refer to the need for an AI solution in your invitation to tender only if there is strong indication that the technology will address the problem that you are trying to solve. A need for the acquisition of an AI system should arise through analysis of policy challenges and alternatives, and be compared to other potential courses of action when the AI project does not have a clear research and innovation focus. If, during the evaluation of the tender responses, it becomes evident that another solution that doesn't incorporate AI is better able to address the problem, you should make the decision to follow this alternative delivery path.
- Assess whether AI could be part of a solution to your problem, before starting the procurement process. If you lack the capabilities in your team to carry out this assessment, you should seek these from elsewhere in your organization or relevant professional network (e.g. academia, trusted vendors) and make the consultation and collaboration with appropriate stakeholders a priority. For this assessment, it is crucial to engage a multistakeholder community to define and test a clear policy problem statement and reflect the findings in the RFP.
- Pre-market engagement is also often essential in helping you to describe your problem and narrow down the tasks that AI may be able to assist with. This will help you better communicate to potential suppliers what you are asking for and why, as well as highlighting where the gaps are. Documenting user need and challenges to the best of your ability is crucial, since the success of the project also depends on how well AI system providers understand the problem.

#### b. Explain in your RFP that public benefit is a main driver of your decision-making process when assessing proposals.

- When setting out the requirements in the RFP, you should consider explicitly referring to public benefit as well as user needs. When determining user needs, public servants should be confident

that they are acting in the public benefit. With regard to AI systems, the public benefit extends beyond value for money and also includes considerations about transparency of the decision-making process and other factors that are included in these guidelines.

- In practice this requires you, for example, to specify success and failure criteria in the context of public benefit: What do you expect such a system to achieve and be capable of, and what are the types of failure and harm that must be avoided? Conducting an impact assessment will help you to set these issues out. Refer to Guideline 7 for additional information on adding ethical requirements to the RFP.

#### c. Conduct an initial AI risk and impact assessment even before starting the procurement process, ensure that your interim findings inform the RFP, and revisit the assessment at decision points.

- To better understand the potential impacts of the use of AI and to mitigate the risks, it is important to start an assessment in a systematic manner before the acquisition of an AI system and to make sure that the findings also inform your commercial strategy. There will be different considerations depending on which policy challenges you are trying to solve and which potential application of AI could help to address this challenge. Without knowing which AI system you will acquire, it is not possible to conduct a whole assessment.
- An initial assessment should outline user needs and affected communities, as well as potential risks such as inaccuracy and bias of the AI system. It should also include some consideration of scenarios involving unintended consequences. The initial assessment should make you think about strategies to address these potential impacts, including but not limited to citizen panels, transparency reports and testing on differentially private or synthetic datasets. Associated risks and their respective mitigation strategies must be recognized by a suitable risk owner with decision-making power and should include a go/no-go decision.
- In your invitation to tender, you should consider asking potential suppliers to identify risks and explain how they would mitigate them. This can give you valuable information regarding how careful each tenderer is and how aware they are of potential risks. Where you identified significant risks in your initial assessments, you should specifically require tenderers to set out how they would address those.

- Data protection impact assessments and equality impact assessments can provide a useful starting point for assessing potential unintended consequences. In assessing these, you should consider how the use of these systems, such as semi-automated or solely automated decisions, interact with mechanisms of oversight, review and other safeguards. We developed a high-level risk assessment, which allows you to make a more informed decision about your approach, and introduced the concept of a proportional approach to AI procurement. See the [AI risk assessment tool in the workbook](#). For other examples of risk assessment questionnaires for automated decision-making, refer to the government of Canada's [Directive on Automated Decision](#)

[Making](#), and the framework on [Algorithmic Impact Assessments](#) from AI Now.

- In addition to the above, there should be systematic and continuous risk monitoring during every stage of the AI solution's life cycle, from design to post-implementation maintenance. AI solution providers can do this by identifying, drafting mitigations for and reporting risks through a project management function, which is central to the implementation (refer to Guideline 9 for more information on how to consider life-cycle management during the procurement process). The impact assessment should be revisited where necessary (e.g. in the event of significant changes to the opportunity statement).

## BOX 2 Example of human rights assessment from Google Cloud

Google Cloud launched a Celebrity Recognition tool to a select set of media and entertainment customers to help them identify and label celebrities in professionally produced content, such as movies and sporting events. From the beginning of the product development process, they engaged in a human rights impact assessment (HRIA) and internal AI principles reviews. In partnership with BSR, a human rights non-profit organization, and using the UN's Guiding Principles on Business and Human Rights as a framework, the team considered potential impacts throughout numerous dimensions including privacy, discrimination, freedom of expression and many others. Aspects such as consultation with potentially affected stakeholders, dialogue with independent expert resources and paying particular attention to those at heightened risk of vulnerability or marginalization were part of the methodology. Their input played

an essential role in shaping the API's capabilities and the policies established around them.<sup>2</sup>

### Some mitigation strategies adopted after this initial human rights risk assessment:

- Creation of "Service Specific Terms" that customers need to agree with. These limit the range of content upon which the API can be used and that address issues such as copyright, hate speech, child rights, surveillance and censorship.
- Adoption of a narrow definition of celebrity that respects the principle of informed consent by only including those that have actively and deliberately sought a role in public life.
- Creation of an "opt-out" option for celebrities not wanting to be included in Google's celebrity database.

FIGURE 3 Visual of the SDLC stages, with sample AI risk assessment question for each stage.

SDLC stage	Sample AI risk mitigation considerations
01 Requirements gathering and analysis	<ul style="list-style-type: none"> <li>- Is the use of AI/ML necessary for the desired outcome?</li> <li>- Should AI/ML even be discussed at this stage?</li> </ul>
02 Design	<ul style="list-style-type: none"> <li>- Do we have consent to use the data sources required by the solution?</li> <li>- Do we fully understand the implications of using external data, models or solutions?</li> </ul>
03 Implementation and coding	<ul style="list-style-type: none"> <li>- Do we have the right skills or domain expertise to develop the solution?</li> <li>- Does the development process protect data confidentiality and integrity?</li> </ul>
04 Testing	<ul style="list-style-type: none"> <li>- What level and type of bias is acceptable in the solution?</li> <li>- Do the acceptance criteria set appropriate levels of accuracy to ensure the model performance is satisfactory?</li> </ul>
05 Deployment	<ul style="list-style-type: none"> <li>- Have users received adequate training to ensure they understand the output of the system?</li> <li>- Is it transparent to users how the solution is deriving an output?</li> </ul>
06 Maintenance	<ul style="list-style-type: none"> <li>- Do the system administrators know what metrics to examine to validate that models are operating as expected?</li> <li>- Is there a clear process for updating or refining models using new data?</li> </ul>

## 6.3 Aim to include your procurement within a strategy for AI adoption across government and learn from others.

“ Many countries are currently in the process of drafting and releasing national AI strategies, and some have already published theirs.

### Why is it important?

To ensure that you use procurement strategically to support efforts on AI development and deployment, and to spread the knowledge of the public application of an emerging technology.

#### a. Consult relevant AI national strategy initiatives and guidance documents from ministries and departments informing public policy of emerging technologies.

- Many countries are currently in the process of drafting and releasing national AI strategies, and some have already published theirs. Prior to commencing an AI rollout, evaluate how your pursuit of acquiring an AI system aligns to your country's overall strategy.
- This allows you to include secondary policy aims in your strategic procurement and potentially make use of economies of scale by pooling the demand for AI systems. An added

benefit of aligning to a national AI strategy is that there may be special support for initiatives that align to the strategy, such as access to additional experts.

#### b. Consult with government agencies that have looked into procuring AI solutions, irrespective of the outcome of the procurement efforts.

- To improve your practices and share your experiences, you could actively seek out collaboration across departments and fields of expertise. You could also share knowledge and feedback via expert communities, such as the digital-buying community, professional networks or meet-ups.
- Within your department it can be helpful to set up platforms and networks that allow for the exchange of information, experiences and best practices about the purchasing of AI-powered solutions.

## 6.4 Ensure that legislation and codes of practice are incorporated in the RFP.

### Why is this important?

Conforming with existing laws and regulations ensures compliance; incorporating codes of practices supports the standardization of norms; and surveying the relevant rules enables better policy-making in a dynamic innovation technology ecosystem.

#### a. Conduct a review of relevant legislation, rights, administrative rules and other relevant norms that govern the types of data and kinds of applications in scope for the project.

- Conduct a review of relevant legislation, human and civil rights, administrative rules, and other relevant norms that govern the types of data and kinds of applications connected to the problem being addressed and solutions being proposed. Clarify the appropriate adjudicative and administrative jurisdictions within the domestic government in relation to conflicts of laws concerning the data. Depending on the problem being addressed in the invitation to tender, existing laws and regulations relevant to that government function may already have some rules on the use, processing, transfer etc. of data. Incorporate those rules and norms into the RFP by referring to the originating laws and regulations.

- When identifying the relevant rules, sources should include not only formal law, but also industry best practices, trade organization consensus guidelines and other forms of norm-setting mechanisms of soft law. For example, freedom of information laws<sup>3</sup> establish rules about what needs to be made available to the public, and data ethics frameworks guide the design of appropriate data use in government and the wider public sector.

#### b. Take into consideration the appropriate confidentiality, trade secret protection and data privacy best practices that may be relevant to the deployment of the AI solutions.

- To meaningfully evaluate proposed AI solutions, government officials must strike the right balance between preserving accountability through transparency and reassuring vendors that the trade secrets associated with their products and services, as well as their business confidentiality, will not be compromised. Information about government processes should be open by default, with the limits of disclosure justified in exceptional circumstances such as export controls, national security or ongoing criminal investigations.

- In those circumstances where confidentiality and trade- secrecy protection can be justified in light of public-interest considerations, investigate the possibilities of facilitating transparency through partial disclosure, limited review options and other means of enhancing public trust.

## 6.5 Articulate the technical feasibility and governance considerations of obtaining relevant data.

### Why is this important?

Availability of relevant data is a prerequisite for any AI solution, so time should not be spent discussing AI procurement if no data will be available. In addition, access to data should be granted only after careful consideration by the data-governing party(ies).

#### a. Ensure that you have proper data-governance mechanisms in place from the start of the procurement process.

- Set out a data-governance approach from the start of the procurement process. Given the importance and complexity of data governance, it is almost mandatory to implement sound data-governance processes before engaging in transformative AI projects. Governance needs to cover all data activities related to the proposed project, such as granting data access to project members, moving/storing data in other locations for analysis, and reviewing data consent (the purposes for which we are authorized to use the data).
- Data governance, and all other aspects of an AI initiative, require a multidisciplinary team. Refer to Guideline 7 for more information on multidisciplinary teams.
- In the absence of a data-governance framework, ensure that it is clear who is accountable (who is responsible for data management during the procurement process and the subsequent project).

#### b. Assess whether relevant data will be available for the project.

- Data is crucial for modern-day AI tools. You should determine, at a high level, data availability before starting your procurement process. This entails developing an understanding of what data might be required for the project. The idea is not to assess all possible data sources, but to build general awareness of data sources of potential interest. Data documentation, using data dictionaries, for example, is helpful when trying to build a high-level understanding of data assets.

- In cases where data is not available for the use case in mind, you may be able to find data through third parties, for example, vendors, partners or data brokers. If data is not available through any channel, engage skilled data scientists (for example, through vendors) to assess whether the use case can be addressed at all in a data- driven manner.

#### c. Define if and how you will share data with the vendor(s) for the procurement initiative and the subsequent project.

- Depending on the sensitivity of your project and data, it is worth considering the release of data to providers during procurement so that bidders can craft a response to the RFP that is tailored to your needs, with assumptions, timelines and fees that match your situation as closely as possible. This improves the quality of RFP responses you receive.
- If you are releasing data that is sensitive and not meant for public consumption, consider releasing only a sample, so that vendors have a clear idea of what the data enables them to do without having access to all of it. When doing this, make sure that you provide a sample that is representative of the overall dataset. Otherwise, vendors might make erroneous assumptions that can impact the quality of bids and consequently the integrity of the project.
- Create and document the appropriate data-sharing conditions. For example:
  - Minimum requirements for the environment where the vendor will host the data (e.g. enterprise laptop that meets the vendor's standards for their sensitive data).
  - Data consent form signed by the vendor's lead for the project, stating that the data will be used exclusively for the pursuit and for no other purpose. It should be clear to vendors that while in possession of the data they are not allowed to use the data for any purpose other than that specified in the RFP.
  - Date for data deletion (e.g. immediately upon submission of the vendor's RFP response). In

“ Data is crucial for modern-day AI tools.

no circumstances should governments allow vendors to keep data after the procurement process, or after the conclusion of the project for successful bidders.

- Confirmation of deletion of all data (e.g. written confirmation of deletion signed and submitted by the vendor's lead for the project).
- There are many anonymization techniques to help safeguard data privacy, including data aggregation, masking and synthetic data.<sup>4</sup> Keep in mind, however, that you must manage anonymized data as carefully as the original data, since it may inadvertently expose important insights. RFPs should encourage innovative technological approaches, such as those mentioned above, that make less intrusive use of data or that achieve the same or similar outcomes with less sensitive datasets.
- Certain vendors may have data that is complementary to the initiative, and it is in your best interest to consider using this data. It is important to have a framework that gives guidance regarding the circumstances under which it is reasonable to accept data from a vendor. Decision criteria could include:
  - Vendor: some vendors could be pre-qualified as accepted data providers, be considered more trustworthy as a result of their previous track record as existing suppliers or have a strong reputation related to their data assets.
  - Domain: some domains – such as health, justice and immigration – are very sensitive. Use of third-party data in these domains requires careful scrutiny before it is accepted.
  - Data precedence and integrity: before using any third-party data, the government should have a clear understanding of how the data was collected, the governance processes employed to ensure its integrity, and whether the third party offering the data is legally allowed to commercialize it for the RFP.

**d. Ensure that you have the required access to data used and produced by the vendor(s) solution.**

1. Access and control of data used and produced by AI models is critical in monitoring, assessing and rectifying performance.
2. You must ensure that you have access to raw input, processed/combined and enriched data produced by the vendor(s) AI models. This should also include third party and open source data, particularly if there is the chance that these will not be available/maintained on a long-term basis.
3. Dependent on the solution(s) proposed the vendor(s) may not be willing or able to provide full access to all data (e.g. to protect IP for SaaS or COTS solution):
  - Access to data should be provided with as wide a scope as possible. The supplier should be able to clearly articulate the reason for restricted sharing and this should be limited to only relevant areas not a blanket justification (e.g. commercially sensitive training sets do not preclude sharing enriched model outputs).
  - You should ensure that, where restricted access is justified, the supplier provides relevant, up-to-date and representative sampled data sets. Ideally these will be constructed from operational/live data.
4. Data ownership should be clearly articulated by the supplier:
  - 4a. You should aim for contractual ownership of the data on a persistent basis.
  - 4b. As a minimum enriched data produced by the AI model(s) should be under “shared ownership” with access rights to all remaining data.
  - 4c. Ideally key data sets should be available for your internal teams to use learn and develop enhanced/new systems and approaches.

FIGURE 4 Sample data governance framework

Deloitte's data governance framework enables organizations to be specific in terms of what goals will be prioritized, what capabilities will be deployed and what results are expected



## 6.6 Highlight the technical and ethical limitations of using the data to avoid issues such as bias.

“ Though available, legal to use and proportionate to need, there may be limitations to data (e.g. data bias) that make an AI approach inappropriate, unreliable or misleading.

### Why is this important?

Though available, legal to use and proportionate to need, there may be limitations to data (e.g. data bias) that make an AI approach inappropriate, unreliable or misleading.

#### a. Consider the susceptibility of data that could be in scope and whether usage of the data is fair.

- As important as data protection is, not all data is sensitive (e.g. open-government data is freely accessible online). All data, sensitive or not, must have its integrity safeguarded, but it is not necessary to keep non-sensitive data behind closed doors. It is important to assess the privacy needs of different datasets to determine the right level of protection. Normally, personally identifiable information (PII), such as financial and health data, is considered extremely sensitive. The RFP needs to reflect data governance requirements for both the procurement process and the project that are in accordance with the nature of the data.
- Select data that fits criteria of fairness. For example, the data should be representative of the population that the AI solution will address, as well as being reasonably recent.<sup>5</sup>

#### b. Highlight known limitations of the data (e.g. quality) in your RFP and require tenderers to describe their strategies on how to address these shortcomings. Have a plan for addressing relevant limitations that you may have missed.

Considerations when deciding if a source of data is suitable include:<sup>6</sup>

- Representativeness (whether the data accurately represents the segment of the population in scope for the AI solution)
- Provenance (including how and why the data was collected)
- Gaps in data quality (e.g. many values missing from a particular data element)
- Bias present in the data (if it is not representative of the population to which the algorithm will be applied)
- Lack of clarity in metadata (for example, confusing or vague data element names)
- Check data completeness, representativeness and accuracy of potential sources before starting the procurement process. Articulate data quality observations and the apparent limitations and, if possible, share those insights through the RFP. Bidders must be aware of these data considerations during the procurement process or, in cases where data is sensitive, the selected provider(s) must be made aware after the contract has been awarded.
- If you do not have the right skills or means to comprehensively check for possible limitations of your data, provide vendors with guiding insights into the high-level state of the data and its origin,<sup>7</sup> so that they can draft adequate proposals. Also, ensure the RFP's data requirements include performing a comprehensive data quality assessment and, if required, development of mitigation strategies for low-quality data.

## 6.7 Work with a diverse, multidisciplinary team.

### Why is this important?

Developing and fulfilling a proper AI RFP will require a diverse team that understands the interdependent disciplines that AI covers, including: domain expertise (e.g. healthcare, transportation), systems and data engineering, model development (e.g. deep learning) and visualization/information design, among others.

#### a. Develop ideas and make decisions throughout the procurement process in a diverse and multidisciplinary team.

- Develop an understanding of the skills that are needed to effectively acquire and maintain an AI-powered solution, before starting the procurement process.
- Assemble multidisciplinary teams that specialize in designing, procuring, evaluating and operationalizing AI systems. These multidisciplinary teams should include expertise in: policy from the domain (e.g. justice) in which the AI solution will be applied, machine learning/data science, data engineering, technology (software and hardware), procurement, ethics and human rights.<sup>8</sup>

- Ensure that you have a diverse team. This should include people from different genders, ethnicities, socioeconomic backgrounds, disabilities and sexualities. You should also make sure that there is a mix of perspectives and points of view. This ensures that problems and solutions are tackled from different angles and helps to mitigate bias.
- This is important when it comes to evaluating tender responses. You need to be certain that you have the right expertise in your team to compare AI-driven solutions. Technical, business as well as legal and ethical experts are needed to score the different bids. You can integrate processes in your procurement decision to ensure that a multidisciplinary evaluation is mandatory. If expertise is lacking within your team, you can reach out to pools or professional networks within your organization or across the civil service.

Note that many value-laden decisions will likely be made during development (i.e. post-procurement), and it is essential that your team maintains the skills, or at the very least access to expertise, to ensure that all important decisions and trade-offs are made or overseen internally, rather than exclusively by a contractor or vendor.

**b. Require the successful bidder(s) to assemble a team with the right skill set.**

- As part of your requirements, ensure bidders provide evidence of the skills and qualifications of the proposed project resources who will develop and deploy the AI solution.<sup>9</sup> This should be part of the RFP response and it should be one of your decision criteria when evaluating the proposals.

## 6.8 Focus throughout the procurement process on mechanisms of accountability and transparency norms.

**Why is this important?**

To build public trust in the legitimacy of the AI system, the procurement process should enable accountability in understanding how the AI solution works, so that it can be evaluated independently and thus promote a culture of responsibility over the AI solution life cycle.

**a. Promote a culture of accountability across AI-powered solutions.**

- Public institutions cannot rely on black-box algorithms to justify decisions that affect individual and collective citizens' rights, especially with the increased understanding about algorithmic bias and its discriminatory effects on access to public resources. There will be different considerations depending on the use case and application of AI that you are aiming to acquire, and you should plan to work with the supplier to explain the application for external scrutiny, ensuring your approach can be held to account. These considerations should link to the risk and impact assessment described in Guideline 2. Under certain scenarios, you could consider making it a requirement for providers to allow independent audit(s) of their solutions. This can help prevent or mitigate unintended outcomes.
- Providers and public officials should incorporate risk analysis for the unexpected and unintended effects of AI-powered solutions, within the limits prescribed by the law, and specify their respective responsibilities in the contract. Note that the laws and standards for assigning accountability may differ according to jurisdiction. For example, the Canadian federal

government's Directive on Automated Decision-Making requires the associate deputy minister of the respective federal entity to sign off on an algorithmic impact assessment (AIA) as part of an AI project.

- Consider how applicable accountability requirements in law, such as freedom of information legislation and data-protection logging requirements, will be implemented throughout the project life cycle.

**b. Ensure that AI decision-making is as transparent as possible.**

- Encourage transparency of AI decision-making (i.e. the decisions and/or insights generated by AI). One way to do this is to encourage the use of explainable AI. You can also make it a requirement for the bidder to provide the required training and knowledge transfer to your team, even making your team part of the AI-implementation journey. Finally, you can ask for documentation that provides information about the algorithm (e.g. data used for training, whether the model is based on supervised, unsupervised or reinforcement learning, or any known biases).
- Documentation is especially important when the algorithm is a pre-packaged solution that the bidder will bring to the project, as opposed to an algorithm that will be built and/or customized as part of the upcoming project. Finally, you can also ask bidders to provide information on their model-building methodology, including how they select variables, build samples (where applicable) and validate the model. Be aware, however, that algorithm-building is an iterative

process and that it depends on creativity as much as it does on science.

- Documentation provided by a bidder will give you directional awareness of their practices and methods; it will not give you a step-by-step guide that details exactly what would be done during the project, as the exact process will invariably shift from project to project to meet the needs of each scenario.

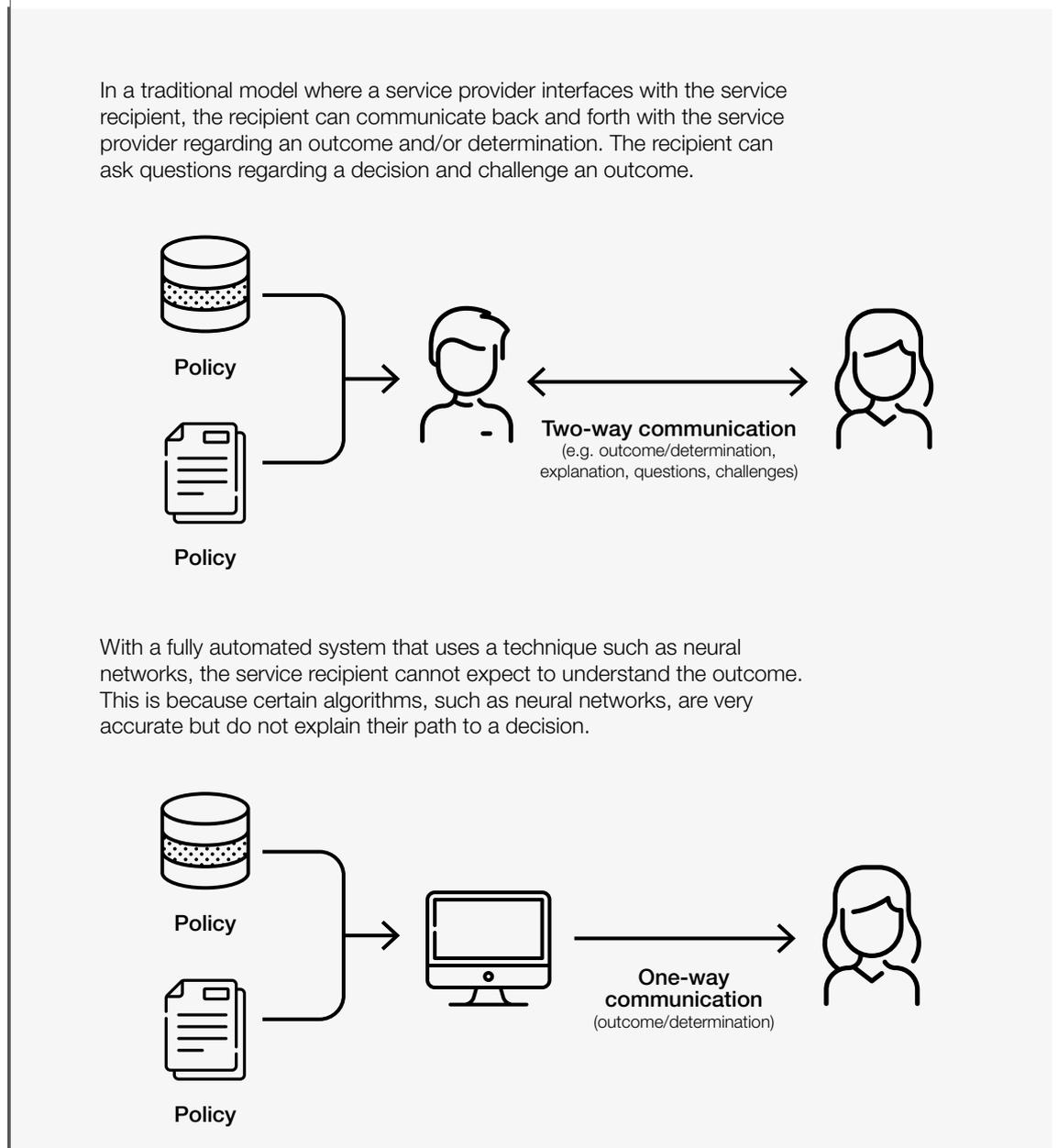
**c. Explore mechanisms to enable interpretability of the algorithms internally and externally as a means of establishing accountability and contestability.**

- With AI solutions that make decisions affecting people's rights and benefits, it is less important to know exactly how a machine-learning model has arrived at a result if we can show logical steps to achieving the outcome. In

other words, the ability to know how and why a model performed in the way it did is a more appropriate means of evaluating transparency in the context of AI. For example, this might include what training data was used, which variables have contributed most to a result, and the types of audit and assurance the model went through in relation to systemic issues such as discrimination and fairness. This should be set out as documentation needed by your supplier.

- It is also important to consider the potential tension between explainability and accuracy of AI when acquiring AI solutions. Classic statistical techniques such as decision-tree models are easier to explain but might have less predictive power, whereas more complex models, such as neural networks, have high predictive power but are considered to be black boxes. Given these challenges you should think carefully about.

FIGURE 5 Diagram to explain what is meant by a “black box” algorithm and why they’re an issue



**BOX 3 | Sample type of documentation to ask for: [Google Model Cards](#)**

Machine learning models are often distributed without a clear understanding of how they function. For example, under what conditions does the model perform best and most consistently? Does it have blind spots? If so, where? Model cards address that issue by providing information about a model's performance and limitations. These "cards" are short documents accompanying trained machine learning models that provide benchmarked

evaluation in a variety of conditions. They are aimed at experts and non-experts alike. Developers can use them to make better decisions about what models to use for what purpose and how to deploy AI responsibly. For journalists and industry analysts, they might provide insights that make it easier to explain complex technology to a general audience and they might even help advocacy groups better understand the impact of AI on their communities.

**FIGURE 6 | Model card example**

Cards content	Sample information provided
01 Overview of the model	<ul style="list-style-type: none"> <li>- Simple description of the model</li> <li>- Input data and output of the model</li> <li>- Model architecture used</li> </ul>
02 Limitations	<ul style="list-style-type: none"> <li>- Factors that might degrade the model's performance</li> <li>- Situations in which the model might perform less than optimally</li> </ul>
03 Performance	<ul style="list-style-type: none"> <li>- Model's performance on various evaluation datasets drawn from different sources than the training data</li> </ul>

**BOX 4 | Solution to address explainability: example from [Google Cloud AI Explainability](#)**

The most useful models are often the most explainable, as they are the most trusted. Cloud AI Explanations help developers and enterprises understand why their AI model made the decisions it did by quantifying how each data factor contributes to the output. They can use this information to improve the models or share useful insights with their end users. The What-If tool, an interactive

visual interface, also allows users to investigate model behaviour by using dataset visualization to explain performance. AI Platform users can develop a deeper understanding of how their models work under different scenarios and build rich visualizations to explain model performance to business users and other stakeholders.

## 6.9 Implement a process for the continued engagement of the AI provider with the acquiring entity for knowledge transfer and long-term risk assessment.

### Why is this important?

The functionality and consequences of AI systems may not be apparent in the procurement process and often become evident only over the duration of its application, requiring extended communication and information-sharing between the procuring entity and the system developer.

For AI systems in the public sector, sustainable and ongoing evaluation methods and means of providing feedback on the data model are crucial to ensure that the tool's use remains ethical. You should make clear in your RFP that this should be considered by the provider and discussed as part of the procurement process.

#### a. Consider during the procurement process that acquiring a tool that includes AI is not a one-time decision; testing the application over its lifespan is crucial.

- The tool will need support during its life cycle. Knowing where to go for that support and how much support is available will be vital for getting the most out of any tool. Accepting the potential impact of any support gaps or employing outside expertise both come at a cost. This should be factored in when purchasing an intelligent tool.
- Consider the implementation of a process-based governance framework that provides a template for the integration of the norms, values and principles that inform the procedures and protocols organizing the project workflow.
- Testing the model on an ongoing basis is necessary to maintain its accuracy. An inaccurate model can result in erroneous decisions and affect users of public services.

Therefore, you should establish with the provider how the efficacy of the model will be monitored once deployed.

#### b. Ask the AI provider for knowledge transfer and training to be part of the engagement.

- Make knowledge transfer a requirement under the RFP. Evaluate the thoroughness and logic of the knowledge-transfer plan to ensure that government resources will be able to use the tool appropriately on their own once the project is finalized.
- Set out clearly your expectations for project documentation. Ensure that maintenance and

auditing of the AI solution would be possible by entities independent of the vendor.

#### c. Ask the AI provider for insights on how to manage the appropriate use of the application by non-specialists.

- Operational or service staff must have enough knowledge or training on the solution to understand how to use it and successfully exploit its outputs. You should address the need for enough training and support to avoid the misuse of AI applications with the AI provider. The application must make it easy to report any suspected unauthorized behaviour to the relevant authority(ies) within and/or outside the organization. Enable end-to-end auditability with a process log that gathers the data across the modelling, training, testing, verifying and implementation phases of the project life cycle. Such a log will allow for the variable accessibility and presentation of information with different users in mind to achieve interpretable and justifiable AI.

#### d. Make ethical considerations part of your evaluation criteria for proposals.

- There are robust ethical practices that you should require suppliers to demonstrate when providing AI solutions. Leading AI-solution providers have begun to create internal frameworks for the ethical design, development and deployment of AI, which cover processes to ensure accountability over algorithms, avoiding outputs of analysis that could result in unfair and/or biased decision-making, designing for reproducibility, testing the model under a range of conditions and defining acceptable model performance. Bidders should be able not only to describe their approach to the above, but also to provide examples of projects, complete with client references, where these considerations have been followed.<sup>10</sup>
- Make comprehensive, transparent algorithm assessment one of the requirements in the proposal and, if applicable, state minimum performance metrics that the model must meet. If possible, work with bidders to determine what the thresholds should be. As part of testing the model, you should work with the provider to establish how often you need to update the model with new data. Testing over the lifespan of the model for suitability and accuracy is highly important, especially when the AI is supporting critical services.

“ The tool will need support during its life cycle.

“ Testing the model on an ongoing basis is necessary to maintain its accuracy.

## 6.10 Create the conditions for a level and fair playing field among AI solution providers.

### Why is this important?

Government spending can be used to create a fair, competitive market, which leads to better AI systems. In addition, early engagement with AI vendors can result in more relevant responses, increasing the probability of success for the procurement and the subsequent project.

While AI systems generate new challenges that you need to reflect within the requirements and procurement approach, you must be proportionate in your approach and not impose any unnecessary burdens that would deter a wide diversity of suppliers, including small and medium sized enterprises (SMEs), Voluntary, Community and Social Enterprise (VCSE) suppliers and those owned by under-represented groups, from competing for public contracts.

#### a. Reach out in various ways to a wide variety of AI solution providers.

- Given the rapidly developing landscape of AI service providers, largely comprising smaller enterprises such as start-ups, consider non-traditional methods of market engagement to attract AI solution providers. For example, explain the needs that lead to the proposal through in-person presentations, webinars, information sessions at co-working spaces and/or online platforms such as LinkedIn or Twitter.
- Consider reaching out to non-traditional stakeholders, such as research institutes and academia. In some cases, these may have the right skills to be part of an AI implementation, and in all cases, they can act as advisers.<sup>11</sup>
- You should ensure that you have taken action to attract a wide diversity of suppliers to bid such SMEs, VCSEs and other under-represented businesses. You should test your approach to ensure it will not deter bidders or create unnecessary burdens on them either during the bidding process or during contract delivery. You must be proportionate in your approach.
- Keep in mind that successfully designing and deploying AI in organizations as big and complex as public agencies requires much more than technical expertise. It requires experience in change management, familiarity with public organizations, and the ability to manage complex projects.

#### b. Engage vendors early and frequently throughout the process.

- Market engagement is a process; it takes place prior to procurement and aims to identify

potential bidders and/ or solutions, build capacity in the market to address challenges and opportunities, and inform the design of the procurement and contract.

- Early engagement between government and industry is vital to a successful AI purchasing campaign. Early supplier engagement can help to determine the scope and feasibility of the RFP and, in turn, the most appropriate way to design and structure the requirements, increasing the likelihood that the winning bidder will meet your needs at a competitive cost. Ways to engage vendors early include having vendors provide inputs on possible evaluation criteria for the RFP, and hosting vendors to walk them through the RFP. Approaches like this are already being deployed in Canada, for example, and greatly help government and the private sector increase the effectiveness of procurement.
- To mitigate any risks that could be associated with market engagement (e.g. commercial confidentiality, protection of intellectual property [IP], fettering discretion of tender process), be sure to broadly advertise the engagement opportunity, allow all interested parties to participate, ensure that there is adequate time for responses and reasonable time for bidder selection and, where appropriate, that RFP responses can be marked as confidential.

#### c. Ensure interoperability of AI solutions and require open licencing terms to avoid vendor lock-in.

- Consider strategies to avoid vendor lock-in, particularly in relation to black-box algorithms. These practices could involve the use of open standards, royalty-free licensing and public domain publication terms.
- During the design and deployment of the AI solution, it is likely that either a new algorithm will be designed, or an existing one will be tailored (e.g. retrained through your data). It is therefore useful to consider whether your department should own that IP and how it would control it. The arrangements should be mutually beneficial and fair, and require royalty-free licencing when adopting a system that includes IP controlled by a vendor.
- In order to preserve access to systems that become obsolete, ensure the ability to reverse-engineer the system to allow for maintenance of the AI solution independent of the vendor.

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private companies, governments, civil society organizations and academia to understand public-sector procurement of AI technology, identify challenges and define principles to guide responsible and ethical procurement. The opinions expressed herein may not correspond with the opinions of all members and organizations involved in the project.

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## 8

# Endnotes

1. Definition from the Engineering and Physical Science Research Council, a UK government research funding body.
2. For the complete results, see <https://services.google.com/fh/files/blogs/bsr-google-cr-api-hria-executive-summary.pdf>
3. For an up-to-date list of freedom of information laws around the world, see [https://en.wikipedia.org/wiki/Freedom\\_of\\_information\\_laws\\_by\\_country](https://en.wikipedia.org/wiki/Freedom_of_information_laws_by_country) (link as of 29.05.2020).
4. For more information on data anonymization, refer to: “Guide to basic data anonymisation techniques”, Personal Data Protection Commission, Singapore. 25 January 2018.
5. For more information on fairness during data selection, refer to: “Understanding artificial intelligence ethics and safety. A guide for the responsible design and implementation of AI systems in the public sector”, section “Data fairness”, David Leslie, the Alan Turing Institute.
6. For more information on data selection criteria, refer to: “Understanding artificial intelligence ethics and safety. A guide for the responsible design and implementation of AI systems in the public sector”, section “Data fairness”, David Leslie, the Alan Turing Institute.
7. For example, summary statistics such as number of rows present, number of missing values for each data field, description of how the data is collected and processed.
8. For more information on the domain and technical skills required to deliver an AI engagement, refer to: “Searching for superstars isn’t the answer. How organizations can build world-class analytics teams that deliver results”, Deloitte.
9. *ibid.*
10. AI ethics is a deep and evolving field, and there are various publications on the matter, including those listed below. Refer to these sources for a full background on the topic.
  - “OECD principles on artificial intelligence”, Organizations for Economic Co-operation and Development
  - “Ethics guidelines for trustworthy AI”, Independent High-Level Expert Group on Artificial Intelligence set up by the European Commission
  - Understanding artificial intelligence ethics and safety. A guide for the responsible design and implementation of AI systems in the public sector”, section “Data fairness”, David Leslie, the Alan Turing Institute.
  - “For a meaningful artificial intelligence. Towards a French and European strategy”, Cédric Villani
11. Examples of organizations include the Alan Turing Institute in the UK and the Vector Institute, MILA, and the Alberta Machine Intelligence Institute in Canada.



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*Unlocking Public Sector AI*

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# AI Procurement in a Box: Workbook

TOOLKIT  
JUNE 2020

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Gus Moretta

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# AI risk assessment tool





## A.1 Overview

This document sets out example decision criteria for conducting an artificial intelligence (AI) project risk assessment. An assessment of the potential risks involved in any solution that contains AI elements should be conducted as part of the planning phase of an AI procurement. This can also be a

useful basis to develop a proportionate approach to AI procurement. It is important to approach AI procurement proportionally because not all guidelines as well as issues explored in guidelines apply to all procurement decisions in the public sector.

### Purpose of this tool

The following table outlines some of the key questions you should consider when deciding your procurement strategy, choosing what requirements to include in your request for proposal (RFP) and assessing a

solution. These questions have also been mapped to the issues that were set out in the *guidelines for AI procurement* document under the risk assessment header in the how to use the guide section.

### How to use this tool

All these questions are designed to be answered with a yes or a no. Note that the list is not exhaustive and you should consider additional risks that are specific to your organization. For some of the questions below it might also be useful to consult the risk-based approach to AI adoption from the

Canadian public sector, which divides AI systems developed at different levels. These categorizations provide insights into how to best approach AI procurement from a proportionality view and will help govern some of the decision-making.

Q1

**Is the solution intended for use in an area of public interest?**

If the project is within an area of intense public scrutiny (e.g. because of privacy concerns), interest and/or frequent litigation, then additional controls may be required. Fields such as health, social assistance, access and mobility, or decisions about permits and licences are examples of areas of applications that demand further consideration.

The higher the impact on individuals, businesses and communities, the more important it becomes to thoroughly consider AI ethics. The risk also increases when decisions made by the systems are linked to groups of people that are particularly vulnerable.

Q2

**Does the data used or generated by the solution contain any biographical or sensitive information?**

The more sensitive the data used or generated within an AI system the greater the number of checks you should build in.

Q3

**Are you comfortable with the data being stored and processed in an externally hosted solution?**

Consider whether the data has any protective markings or handling requirements that necessitate storage on authority infrastructure, such as a fully managed data centre or within a private cloud environment.

If your organization has a cloud-first policy and the data is suitable, a SaaS solution may be appropriate.

Q4

**Do you need to understand the details of how the data is being processed?**

For low-risk applications it might be appropriate to consider solutions that provide limited insight into how the data is processed, but if the solution is intended for processing personal information (such as medical applications), it may be useful to know the details of how it's been processed to ensure the outcome can be explained.

Q5

**Do you need the results of the processing to be validated by a human or is an automated output acceptable?**

If the output of the solution is intended for making critical decisions about services that are provided directly to citizens, then validation of the output is necessary. Alternatively, if you are considering a solution for managing cloud infrastructure to ensure the performance of a given application it might be appropriate for this to be fully automated.

Q6

**Do you have the skills and knowledge to define and assess the performance of the solution?**

Depending on the levels of expertise within your organization you may need to rely more heavily on a supplier or vendor to curate the solution for you. In this case you should expect the supplier to provide more detailed information about how they manage the solution.

If you have strong organizational data science skills, however, you should be able to more easily set the performance parameters, which makes custom solutions more achievable.

Q7

**Are you confident that the data intended for use in the solution is of good quality?**

The less sure you are about the quality of your data, the better it is to build in additional assurances to avoid bias.

Q8

**Are you happy for the supplier or vendor to enrich the data with external information as part of the processing?**

Some solutions will use external data feeds to draw conclusions from your data, and the source and utility of this external data should be considered when assessing what is acceptable for your organization.

The following table links the issues set out in the *guidelines for AI procurement* document to the most relevant questions.

FIGURE 1 Mapping guideline topics to the risk assessment tool

Issue	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Data								
Field of use								
Socio-economic impact								
Financial consequences for agency and individuals								
Business function of the AI system								

## A.2 Essential requirements in a proportionate approach

The following table outlines how the answers to the questions relate to the requirements described in the workbook Part C AI Procurement Specification and Evaluation Tool. It highlights the most important requirements related to the risk assessment. Please note that this does not mean that other requirements aren't also essential.

FIGURE 2 How risk assessment relates to AI-specific RFP requirements

		Essential requirements	Additional requirements
Q1	Is the solution intended for use in an area of public interest?	1.1	If Yes: Add more weight to 1.1
Q2	Does the data used or generated by the solution contain any biographical or sensitive information?	4.2, 4.3	If Yes: 4.4
Q3	Are you comfortable with the data being stored and processed in an externally hosted solution?	2.2	If Yes: 3.1, 3.2
Q4	Do you need to understand the details of how the data is being processed?	1.4, 1.7, 4.1	If Yes: 1.2, 1.3, 1.5, 7.1, 8.1
Q5	Do you need the results of the processing to be validated by a human or is an automated output acceptable?	1.6, 2.3, 9.1, 9.2	
Q6	Do you have the skills and knowledge to define and assess the performance of the solution?	3.3, 6.1, 9.3	If No: 3.4, 5.2, 5.3, 4.5, 10.1
Q7	Are you confident that the data intended for use in the solution is of good quality?		If No: 4.1
Q8	Are you happy for the supplier or vendor to enrich the data with external information as part of the processing?		If Yes: 2.1

## A.3 Risk matrix

The risk matrix is designed to help the user determine their hosting and processing risks and what this means in terms of what types of solutions can be considered.

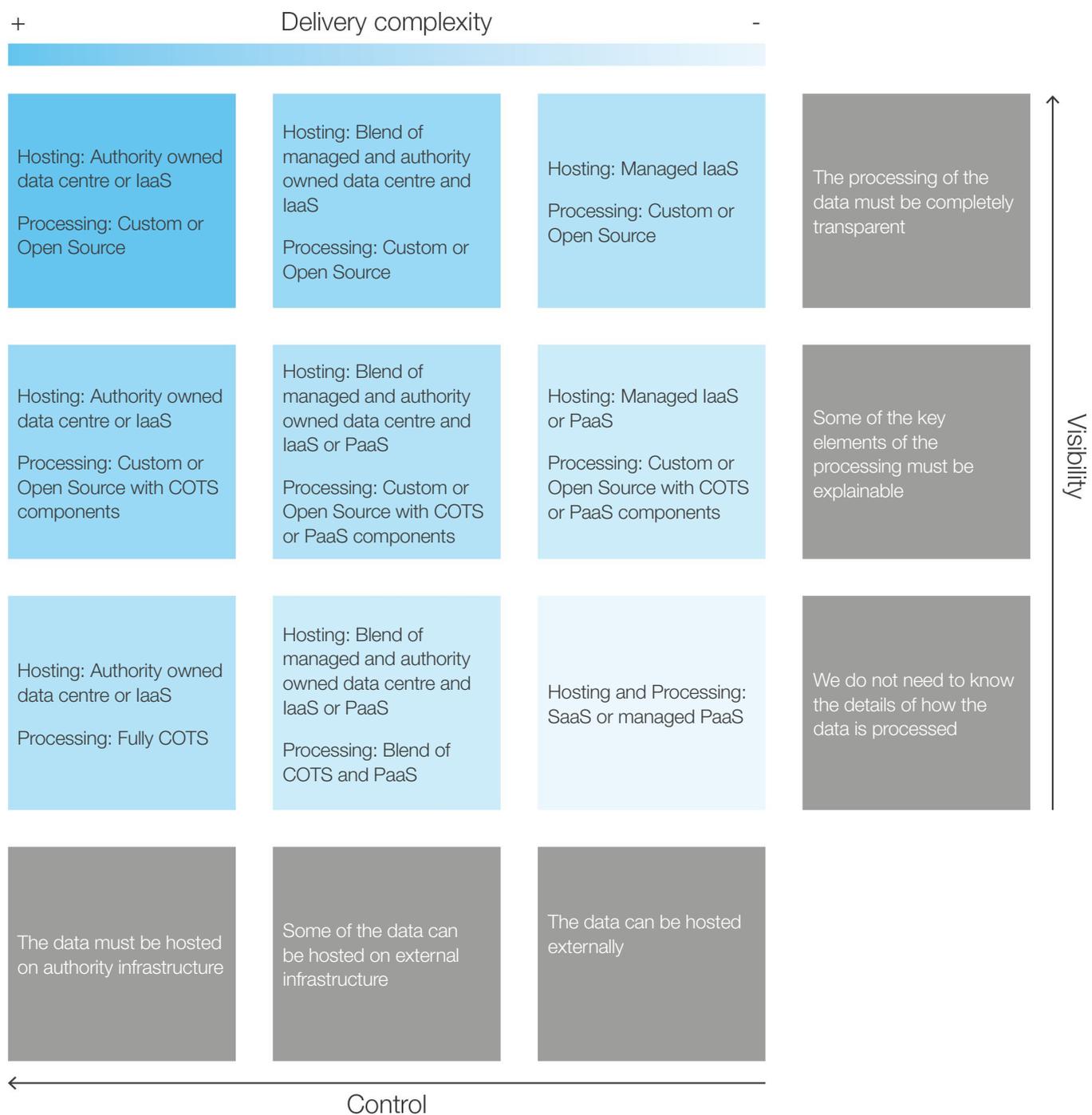
When considering the risks, you should:

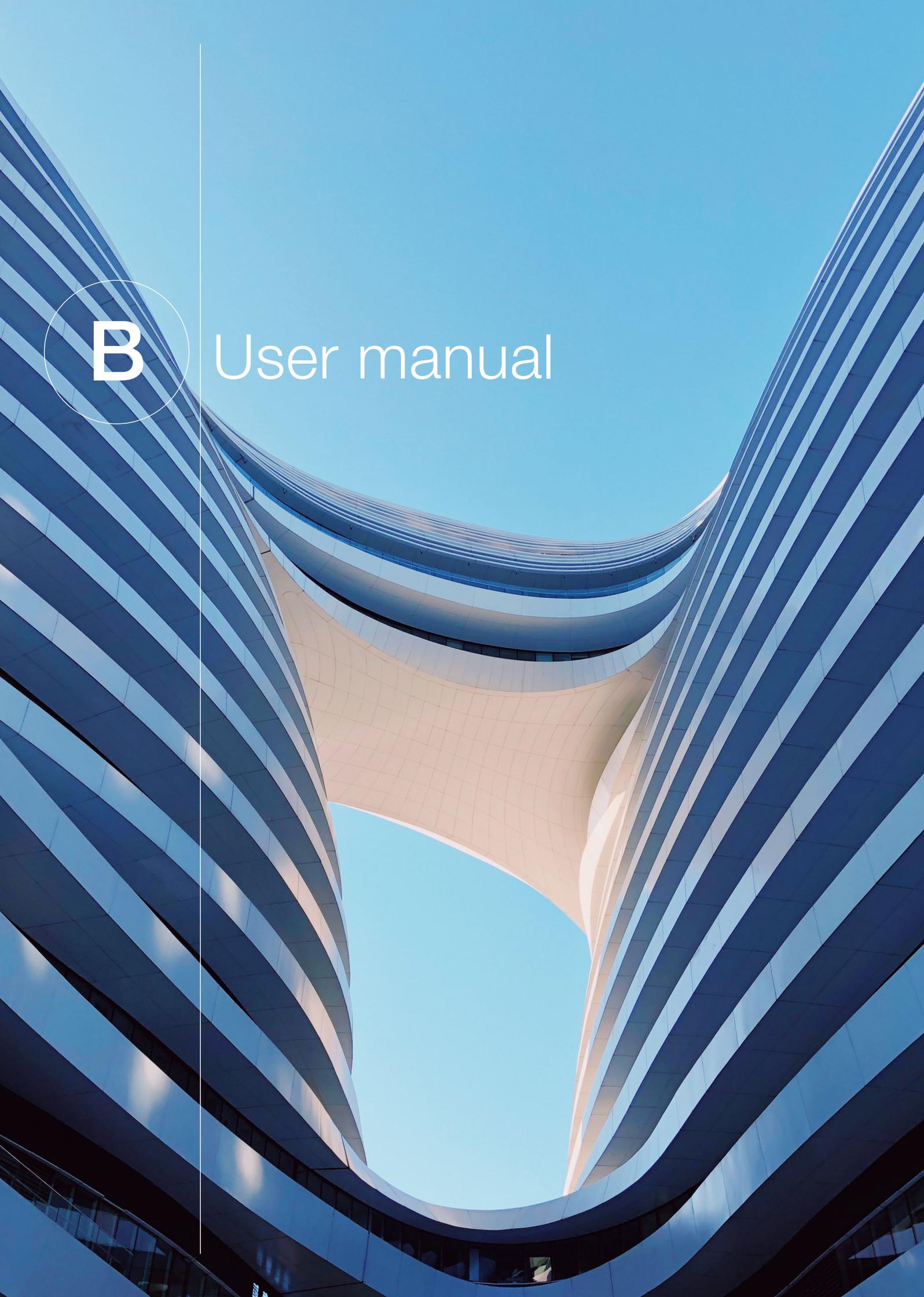
- For control (or hosting) risks: consider your answers to questions 2 and 3 above.
- For visibility (or processing) risks: consider your answers to questions 4, 5 and 6 above.

Depending on your control and visibility posture the diagram will help you determine what solutions may be appropriate. For example, if all of the data can be hosted externally and you do not need visibility of the processing a SaaS offering could be appropriate. Note that for any box you land on from a visibility and control perspective, solutions that fit types above and/or to the left would also be appropriate, but bring a higher delivery risk.

For clarity you can find definitions for Open Source<sup>1</sup>, COTS<sup>2</sup>, IaaS<sup>3</sup>, PaaS<sup>4</sup> and SaaS<sup>5</sup> from the links found in the endnotes section.

FIGURE 3 Risk matrix





**B**

User manual

## Overview:

### Key factors to consider when beginning the procurement process for an AI-enabled solution

This manual provides a set of questions that highlight the main considerations that users should be able to address when implementing the guidelines.

1

#### Use procurement processes that focus not on prescribing a specific solution but rather on outlining problems and opportunities, and allow room for iteration.

##### Purpose of this tool

The user manual should help users to work through the different guidelines and find out how they apply to the specific project that they are working on.

##### How to use this tool

You can use the questions as a checklist at start of your procurement process.

#### 1a. Make use of innovative procurement processes to acquire AI systems.

- Does your agency have access to a procurement vehicle(s) developed specifically for innovative technologies, such as AI?
- Have you engaged peers who have leveraged this procurement vehicle(s) in the past, whether inside or outside your agency, to learn from their experience?
- Are you leveraging any special mechanisms made available by the procurement process, such as agile procurement, challenge-based procurement, and/or dynamic purchasing systems?
- Does the procurement vehicle allow the procurement team to evaluate responses within a reasonable amount of time, so as not to exclude potential participants?

#### 1b. Focus on developing a clear problem statement, rather than detailing the specifics of a solution.

- Do you have a clear, concise problem statement that focuses on the needs of a user (e.g. benefit applicants)?
- Have you phrased your problem in a way that is technology agnostic?
- Have you engaged a group of peers and market partners, preferably knowledgeable in human-centric design, to confirm that you are addressing the root cause of the problem, as opposed to a symptom?

#### 1c. Support an iterative approach to product development.

- Can you set expectations with providers through the RFP that the project must be delivered using an iterative (e.g. agile) approach?
- Can the problem be broken down into more manageable contracts and projects?

## Define the public benefit of using AI, while assessing risks.

### 2a. Set out clearly in your RFP why you consider AI to be relevant to the problem and be open to alternative technical solutions.

- Do you have strong indications that AI is applicable to the problem? (e.g. do you have large amounts of data you could use to derive insights that address the problem?)
- Can the problem be addressed through a technology/solution that is likely to be better understood by the resources who will be responsible for delivering and operating it?
- Have you engaged peers and vendors to confirm that AI is a good solution to the problem?

### 2b. Explain in your RFP that public benefit is a main driver of your decision-making process when assessing proposals.

- Have you identified the protected groups, whether internal or external, who would be affected by the decision-making of the AI solution?
- Have you identified the potential biases that could exist in the data, which could unfairly affect the protected groups previously identified?
- Have you engaged the parties who will be affected by the tool and obtained their inputs (e.g. by holding citizen panels)?
- Have you identified success and failure criteria for the solution from the perspective of the stakeholders who would be affected by the solution?

### 2c. Conduct an initial AI risk and impact assessment before starting the procurement process, ensure that your interim findings inform the RFP and revisit the assessment at decision points.

- Have you identified the high-level potential impacts, including unanticipated consequences, that a solution could have on stakeholders? For example, for an AI-driven unemployment solution, could eligible recipients be wrongfully denied the benefit?
- Have you documented these potential impacts, together with viable mitigation strategies?
- Has executive management signed off the impact assessment?
- Have you included the results of the impact assessment in the RFP and asked vendors to suggest mitigation strategies?

## 3

### **Align your procurement with relevant existing government strategies and contribute to their further improvement.**

#### **3a. Consult relevant government initiatives, such as AI national strategies, innovation and/or industrial strategies and guidance documents informing public policy about emerging technologies.**

- Have you identified relevant national strategies (e.g. AI strategy, digital strategy) and evaluated how your project can align?
- Have you identified and consulted on relevant policies and guidance frameworks, whether internal or external (e.g. innovation policies, technology policies, data policies and industry norms)?

#### **3b. Collaborate with other relevant government bodies and institutions to share insights and learn from each other.**

- Have you consulted peers, inside and outside your agency, who are specifically knowledgeable on govtech as well as the government's innovation and data policy agenda?
- Is there a public-sector community of practice or established body of knowledge that can be consulted for ideas on the solution and its potential benefits and risks?
- Have you consulted a repository of previous government AI projects for lessons learned?

## 4

### **Incorporate potentially relevant legislation and codes of practice in your RFP.**

#### **4a. Conduct a review of relevant legislation, rights, administrative rules and other relevant norms that govern the types of data and kinds of applications in scope for the project and reference them in the RFP.**

- Have you consulted legal experts to ensure that the RFP addresses any and all legislation that could be relevant (e.g. with regard to privacy, national security)?
- Have you investigated whether there are commonly accepted industry practices regarding data?
- If applicable, have you established the governing law of data in cases of cross-border data flows?
- Have you set expectations in the RFP that contestability (i.e. the ability for a user to appeal against a decision made by the AI tool) will be built into the tool?

**4b. Take into consideration the appropriate confidentiality, trade-secret protection and data-privacy best practices that may be relevant to the deployment of the AI systems.**

- Have you agreed on what is commercially valuable information with the vendor to ensure that confidentiality and intellectual property protection are preserved?
- Have you consulted the freedom of information policies that would govern the required disclosures of information to the public to ensure accountability?
- Will the transfer and processing of personally identifiable data in relation to the solution be consistent with data protection and domestic privacy laws?

**5**

**Articulate the technical and administrative feasibility of accessing relevant data.**

**5a. Ensure that you have proper data governance mechanisms in place from the start of the procurement process.**

- How sensitive is the data that could be in scope? For example, could a solution potentially involve personally identifiable information (e.g., licence number, social insurance/security number, financial data, health data, etc.)?
- Are there processes in place to protect and manage data that could be used during the project?
- Are there processes in place to protect and manage data that could be used during the procurement process itself?
- Who will ultimately be accountable for the usage of data during the procurement process and the subsequent project (e.g. the Chief Data Officer, the data set's steward, etc.)?
- Is there an escalation mechanism for any procurement team members who may have a concern about potential data usage?

**5b. Assess whether relevant data will be available for the project.**

- Have you conducted a high level assessment to understand what data would be required to address the problem statement (e.g. necessary data sources or missing data)?
- Is the process to access this data understood, including identifying the data owner?
- Is there an understanding of how data would be accessed by the successful vendor(s) (e.g., onsite without leaving your data environment, remotely through VPN)?

**5c. Define if and how you will share data with the vendor(s) for the procurement initiative and the subsequent project.**

- Is there a case for sharing data with vendors (e.g. the benefits of sharing outweigh the risks)?

- If you have decided to share data, what mechanisms will you put in place to ensure the safety, confidentiality and privacy of the data?
- If you have decided to share data and you will be sharing a sample, how will you ensure the sample is representative of the users that will be affected by a possible solution?

**5d. Ensure that you have the required access to data used and produced by the AI system.**

- Have you asked for access to raw input, processed/combined and enriched data produced by the supplier(s) AI models?
- In case data sharing was not permitted, has the supplier been able to clearly articulate the reason for restricted sharing?
- Have you set out data ownership criteria for the AI system?

**6**

**Highlight the technical and ethical limitations of intended uses of data to avoid issues such as historical data bias.**

**6a. Consider the susceptibility of data that could be in scope and whether usage of the data is fair.**

- Would a solution use personally identifiable data, including but not limited to personal contact information, unique personal identifiers (e.g. licence number, social insurance/security number), financial data and/or health data?
- Would a solution use sensitive government data (e.g. military data)?
- What would be the impact of a data breach that could be in scope for the AI system?
- Does the data that could potentially be used for the project meet criteria for fairness, as specified in the guidelines?

**6b. Highlight known limitations (e.g. quality) of the data in the RFP and require those tendering to describe their strategies on how to address the shortcomings. Have a plan for addressing relevant limitations that you may have missed.**

- Does the team that owns and/or manages the data understand the data generation process?
- Have you consulted the data owner to obtain a high-level assessment of the integrity of the data?
- If data is of poor quality, have you considered alternative data sources, or consulted peers and/or market partners to seek advice on whether the data is usable and how much effort would be required to close the gaps?
- Is the data representative of the population to which the solution would apply or is the data biased? If biased, how will the bias(es) be addressed?

## 7

### **Work with a diverse, multidisciplinary team.**

#### **7a. Develop ideas and make decisions throughout the procurement process in a multidisciplinary team.**

- Do you have a clear understanding of the skills that will be required to conduct the procurement process, including those relevant to policy, procurement, data and AI?
- Have you put together a team that has the skill set needed to effectively acquire and maintain the AI solution?
- How do research and consultations develop an understanding of the impact on diverse stakeholders/stakeholder groups?
- Is your team diverse? Does it promote inclusion in its composition? At a minimum, do you meet domestic laws of anti-discrimination?

#### **7b. Require the successful bidder(s) to assemble a team with the right skill set.**

- Will you require the successful bidder to include in its team resources with understanding of the affected group(s)?
- Will you require the successful bidder to meaningfully engage with the affected group throughout the design process of the solution?
- Does the RFP evaluation criteria assign a score for team diversity?

## 8

### **Throughout the procurement process focus on mechanisms of algorithmic accountability and transparency norms.**

#### **8a. Promote a culture of accountability throughout AI-powered solutions.**

- Would the solution involve a human in the loop or would it be fully automated?
- Is the solution clearly understood by all stakeholders relevant to the RFP who would ultimately be accountable for the solution and its respective outcomes?
- Has an initial impact assessment for a possible solution been created as part of the procurement process, as well as been approved by the relevant stakeholders?

#### **8b. Ensure that AI decision-making is as transparent as possible.**

- Has an assessment been performed to gauge the necessary level of human oversight, given the sensitivity of the use case, the population affected by the solution and the data?
- Does the RFP ask the successful bidder(s) to create detailed user journey maps, including defining the level of information about the decision-making that the user would expect throughout the journey?
- Does the RFP ask the successful bidder(s) to provide users with an appeal mechanism when the user does not agree with an AI-driven outcome/determination?

- Does the RFP ask the successful bidder(s) to always inform users that they are interacting with a virtual agent, as opposed to a person?

**8c. Explore mechanisms to enable interpretability of the algorithms internally and externally as a means of establishing accountability and contestability.**

- Does the RFP require successful bidder(s) to provide documentation on the logic behind the algorithm, written in a way that can be understood by users with a limited knowledge of AI systems?
- Does the RFP require successful bidder(s) to provide detailed documentation of the solution and its processes?
- Does the RFP encourage successful bidder(s) to choose the least technically complex solution that will meet the requirements?

**9**

**Implement a process for the continued engagement of the AI provider with the acquiring entity for knowledge transfer and long-term risk assessment.**

**9a. Consider during the procurement process that acquiring a tool that includes AI is not a one-time decision; testing the application over its lifespan is crucial.**

- Has it been established whether the solution will be supported in-house or through a vendor? If through a vendor, will it be through the original vendor or a third party?
- Does the RFP require the successful bidder(s) to define how often the model should be updated to maintain the required performance?
- Does the RFP require the successful bidder(s) to agree to third-party solution audits and to provide the necessary level of access required for maintenance and support?
- Does the RFP ensure the necessary level of access, interoperability and data portability required for maintenance and support?
- Have you defined whether the optimal way to source the solution is through one or multiple contracts (e.g. through consideration of budget, risk management, access to skills)?

**9b. Ask the AI provider to ensure that knowledge transfer and training are part of the engagement.**

- Does the RFP require the successful bidder(s) to define how often and by whom the model should be updated to maintain the required performance?
- Does the RFP require the successful bidder(s) to define how they will team up with the public-sector authority to share insights into the technology and provide knowledge transfer?
- Does the RFP require the successful bidder(s) to provide thorough and holistic documentation about the solution?

**9c. Ask the AI provider for insights into how to manage the appropriate use of the application by non-specialists.**

- Does the RFP require the successful bidder(s) to provide training material and/or documentation sufficient for relevant non-technical staff to be able to effectively operate and govern the solution?
- Have you incorporated access control mechanisms to prevent unauthorized and unintended uses of the solution?

**9d. Make ethical considerations part of your evaluation criteria for proposals.**

- Does the RFP ask bidders to provide their own ethics framework for data and AI?
- Does the RFP require bidders to comply with existing government ethics standards, including those created specifically for AI?
- Does the RFP ask bidders to propose process and/or system metrics that reflect a consideration for ethical standards?
- Does the RFP's scoring assign non-trivial weight to ethics capabilities and experience shown by bidders?

**10**

**Create the conditions for a level and fair playing field among AI solution providers.**

**10a. Contact a variety of AI solution providers in various ways.**

- How could traditional and non-traditional partners, such as start-ups and academia, add value to the project?
- Have you actively sought new ways of market engagement, such as hosting a Q&A session, pre-RFP sessions to discuss the problem, supplier days, hackathons or co-working space presentations?

**10b. Engage vendors early and frequently throughout the process.**

- Have you validated the problem statement and your assumptions (e.g. user needs, applicability of AI) with potential partners?
- Have you defined a single point of contact for bidders who have questions and provided the relevant contact information?

**10c. Ensure interoperability of AI solutions and require open licencing terms to avoid vendor lock-in.**

- Does the RFP set expectations that tools used be open source and that open standards be leveraged as much as possible?
- Is there a clear understanding between vendors and the contracting agency regarding IP ownership of the project's deliverables?
- Does the solution involve technologies that contain patents or other intellectual property and if so is licencing available royalty-free?



# AI specification and evaluation tool

## Overview

This tool provides examples of requirements for civil servants to include in a request for proposal (RFP). It also highlights examples of robust AI systems development as well as deployment practices to look out for in the responses or discussions with suppliers. It is intended to be used during the procurement process in conjunction with the AI procurement guidelines as well as the risk

assessment that should allow for a proportionate approach to procurement. The key principle for AI procurement is to clearly describe the problem the contracting authority is aiming to address, focus on outcome-based criteria and not overspecify the AI system, ensuring that the most suitable system is purchased and to innovation is supported.

## Purpose of this tool

This document aims to provide you with an introduction on what to consider when evaluating AI systems during the procurement process. It gives examples of several questions that you can ask while procuring AI systems from suppliers in

categories such as intended use, accuracy of data, fairness and transparency of algorithmic-based decision flows, data security and effectiveness of the systems in meeting intended use.

## How to use this tool

You can consult this document while drafting RFPs and evaluating responses. To use this document effectively please refer to the AI risk assessment tool in the workbook to identify which AI systems and procurement considerations may be more relevant for your project and to assess your requirements.

This document does not aim to provide a recommendation for an exhaustive list of necessary requirements that suppliers need to respond to. It highlights issues that can be considered when setting out specifications in RFPs or evaluation responses in an iterative process. You might already

have robust processes in place for some of the issues mentioned below. These examples should not replace those processes, but rather introduce additional criteria to consider due to the complexity added by the AI system. The table below outlines how to use the document in more detail.

Note that the requirements and criteria in this document are for guidance purposes only. It is essential that you consider the importance of the requirements against your needs and tailor your questions and evaluation accordingly.



**Purpose:** The supplier understands the problem to be solved and the purpose and goals of the technical AI system

**Sample specification**

**Key considerations to look out for in the answers**

1.1 Describe the area of the problem space that is addressed by your AI system.

1. Does the supplier articulate the part of your problem that is addressed by the AI system?
2. Does the supplier recognize and describe any limitations of the AI system for the problem at hand?
3. Is it made clear if the AI system is dependent on those AI elements being added?
4. Can the supplier justify why use of AI/ML is the best approach to address the problem?

1.2 Is your approach built on an existing AI system (Commercial Off the Shelf (COTS)) or will it be custom-made or a mix of the two?

5. Does the supplier describe the elements of the AI system and where they originate?

1.3 Describe what algorithms or techniques you anticipate the AI system to implement.

6. Does the supplier explain the techniques applied in the AI system, including use of any algorithms and associated software libraries for the algorithms?
7. Can the supplier explain how the system operates in an easy to understand way for various audiences?

1.4 Describe the approach to ensuring that use of AI is necessary and proportionate in the AI system.

8. Does the supplier explain the metrics and evaluation methods used and how they have impacted the selection of data that will be used in the proposed AI system?
9. Can the supplier articulate potential risks of using the AI/ML solution and risk mitigation strategies?

1.5 Describe how you have ensured that the AI system is proportional to the data available.

10. Does the supplier explain how it will be ensured that data needs required to produce the intended outcome are considered proportional?
11. Is the supplier capable of mitigating the data supply that they need from the operator?
12. Does the supplier explain the need to access various data sets?

1.6 Explain how all end users have been considered throughout the design and implementation process.

13. Does the supplier describe how the proposed AI system supports transparency and explainability characteristics not just for the data subject, but the end user/operator as well?
14. Does the supplier set out a plan that allows for user testing and an iterative design approach and risk mitigation?

1.7 Explain how you will demonstrate accountability for the goals and outcomes of the AI system.

1. Does the supplier describe the end user training they commit to deliver to ensure the ongoing health and maintenance of the AI system and outcomes?
2. Is the supplier providing documentation detailing how the AI system can be configured or adapted if the results are not delivering the goals or the AI is not acting in an ethical or understandable manner?

## 2

**Consent and control:** The developer will ensure that they have consent from the data subject before processing data or training an algorithm, and that human operators can control the outcome

### Sample specification

2.1 Please provide evidence that you have considered the legal and ethical implications and gathered consent for processing and capturing the data throughout the full lifecycle of the AI system.

NOTE: criteria correspond to COTS AI system. Same criteria can, however, apply to tailored products (e.g. "The supplier provides information on what individuals will be told, when they will be made aware, what kind of consent will be needed from them, and what the procedures will be for gathering consent.").

2.2 Describe your approach for allowing access and control of the data within the AI system.

2.3 Describe the level of human decision-making at critical control points.

### Key considerations to look out for in the answers

17. Can the supplier articulate how it was decided whose data to use or about whom to make inferences?
18. Is it clear that data subjects know that their data is being used or that inferences are being made about them?
19. Does the supplier provide information on what individuals were told, when they were made aware, what kind of consent was needed from them, and what the procedures were for gathering consent?
20. Does the supplier highlight potential risks to these individuals or groups and how the service output might interfere with individual rights?
21. In the case of risk identification, does the supplier describe how the risks are being handled or minimized?
22. Does the supplier describe how the rights of individuals who provided the data were safeguarded throughout the process?
23. Is it made clear whether individuals have the option to withdraw their data and opt out from inferences being made about them? If yes, what is the withdrawal procedure?

Suppliers should ensure that all raw input, processed, training and enriched data is accessible and usable in a timely manner for the public-sector authority, especially for monitoring and inspection. Ideally the suppliers process and data governance should make sure that persistent ownership and access to this data is granted to the public-sector authority, including third party and/or open source data sets.

24. Does the supplier provide access to the AI model(s) input data, including any third party or open source data including mechanisms for controlling the flow of data?
25. Can the supplier provide access to all the AI-model(s) training data and when this is not feasible explain the process for providing a representative sample?
26. Can the supplier provide full access to the AI model(s) processed/combined and enriched data (i.e. key features, inferred scores/metrics) and when this is not feasible explain the process for providing a representative sample?
27. Does the supplier describe the level of contractual ownership that will be granted to the above data and for what period?

28. Does the supplier describe the approach to active monitoring to track user behaviour to identify irregular patterns that may indicate signs of unintended consequences?
29. Does the supplier mention operational bias reviews to track model inputs and outputs to identify irregularities that may indicate bias?
30. Does the supplier mention that they might retrain the model in agreement with the operator using new or more up-to-date data to account for changes in user behaviour?

# 3

## Privacy and cybersecurity: The supplier will not introduce harm through unintended consequences or poor practice

### Sample specification

### Key considerations to look out for in the answers

3.1 Describe your privacy and cybersecurity approach for the proposed AI system as well as how the data will be protected.

NOTE: COTS and bespoke AI systems will have dependency on security controls managed by the authority.

- 31. Does the supplier deploy well-established techniques, security processes and standards to protect the data, for example, encryption and anonymization, where appropriate and feasible?
- 32. Does the supplier describe how need-to-know principles for data access are applied and the decision criteria for allowing access to data and AI models?

For legitimate and logical reasons, protected and or sensitive data may be required and processed by the AI system. Development teams should invest time in understanding the reasons why the data is sensitive and the impact on the data subjects in the event of a biased decision or data breach. Typically, AI systems must not be designed to be fully autonomous. Human operators or even data subjects should be able to intervene or interrupt in the event of incorrect or harmful decisions being made and/or be asked to confirm a processing phase or learning step before it commences.

3.2 Describe the potential threats to the system or AI system from external or internal adversaries.

NOTE: Bespoke AI systems may have dependencies on authority risks, but should be able to describe risks that are specific to the AI system.

- 33. Does the supplier define how the system could be attacked or abused?
- 34. Suppliers could:
  - List applications or scenarios for which the service is unsuitable.
  - Describe specific concerns and sensitive use cases and what procedures can be put in place to ensure that the service will not be used for these applications, or if the service needs to be used in a sensitive use case the precautions being taken to mitigate harm.
  - Underline that they will verify AI model stability when exposed to sub-system compromise and/or outages.
  - Describe how they are securing user or usage data.
  - Identify if usage data from service operations is retained and stored.
  - Ascertain how the data is being stored and for how long the data is stored.
  - Mention how they will verify if enriched and/or inferred user or usage data is being shared outside the service and who has access to the data.
  - Describe how the service checked for robustness against adversarial attacks, including once it is integrated/deployed at scale.
  - Explain how robustness policies will be checked and the type of attacks considered.
  - Propose a plan to handle any potential security breaches based on accepted industry best practice.

3.3 Explain your test processes, including the specialist expertise used to assess the AI system.

- 35. Does the supplier provide evidence that the AI system has been tested and that AI domain experts were involved in the development, testing and deployment?
- 36. Can the supplier describe how the AI model(s) will be monitored and checked to highlight potential malicious manipulation (internal and external)?

3.4 Please provide evidence of previous case studies of where the AI system has been implemented and how the output has been interpreted, highlighting best practice.

- 37. Does the supplier provide evidence of where the AI system has been used before?
- 38. Can the supplier point to previous use cases that include description of how the output has been consumed, drawing out if any harm or negative impact on the end users or data subjects was introduced through misuse or misinterpretation?

4

**Ethical considerations:** Will the service or AI system be fair in its decision making and processing

**Sample specification**

**Key considerations to look out for in the answers**

4.1 What data limitations have you identified and what strategies will you implement to address these data limitations?

NOTE: this is applicable only when the authority has shared data with the supplier or when the supplier is using pre-trained models or their own data. Otherwise, this should be assessed during AI system design.

39. Can the supplier describe where they have missing or poor quality data? Are they able to identify potential risks that arise from missing or poor data and can they articulate how they are mitigating these risks?

Suppliers should be able to describe how data bias policies will be checked (with respect to known protected attributes), bias checking methods and results (e.g. disparate error rates throughout different groups).

Suppliers should also be aware of the personal or unconscious bias inherent in the development team and the human operators of the AI system and how it influences the output of the system. Bias may also be a legitimate input in certain problem sets or use cases, but unconscious or personal bias that undermine the correctness of the outcome or introduces harm must be avoided. There needs to be a focus on detecting unconscious or personal bias during the training and testing of the algorithm.

Given the needs to adapt processes to ensure fair treatment for persons with disabilities as employees and as service users and citizens accessing government information and services – suppliers must be required to demonstrate that the end-to-end process they are influencing or managing is non-discriminatory – it is important, but far from sufficient, to just address data bias.

4.2 How will you ensure that the AI system fits the requirements of data ethics frameworks and policies prior to going live?

40. Is the supplier able to demonstrate how data ethics principles referred to in the RFP are considered in designing, building and supporting their AI system?

4.3 Describe the approach to eliminate (or minimize) bias, ethical issues or other safety risks as a result of using the service.

41. Can the supplier describe the possible sources of bias or unfairness assessed and where they arise from – the data, the techniques being implemented or other sources?

42. Is there any mechanism for redress if individuals are negatively affected?

4.4 Describe the process for ensuring that the development team adopts an ethical mindset.

43. Does the supplier offer training or have an awareness process to ensure their team understands the potential impact of creating an AI system that produces an incorrect, biased or disproportional output?

44. Can the supplier describe how they educate their staff to understand and accept that individuals have unconscious bias and understand their responsibility for ensuring this does not affect the operation of the AI system?

5.5 Explain how the AI system will be tested during the life cycle to detect bias and the remediation steps if it is introduced.

45. Can the supplier describe bias policies models and bias checking procedures, as well as how they will monitor and verify results (e.g. disparate error rates throughout different groups) with a focus on controls for unacceptable bias and/or defined thresholds?

46. Does the supplier highlight life cycle considerations and maintenance of the AI system? Do these considerations include model validation processes to assess performance against defined tolerances and/or thresholds and demonstrate their ability to highlight other potentially less visible problems (i.e. overfitting)?

5

**Explainability:** Can the supplier adequately explain how the AI system functions to the affected consumer, data subject or operator

**Sample specification**

**Key considerations to look out for in the answers**

5.1 Describe the provisions in the AI system to ensure that the outputs are explainable and/or interpretable.

- 47. Is the supplier able to define how their organization approaches ethics?
- 48. Is the supplier able to show how they aim to aid the explainability of their AI system (e.g. directly explainable algorithm, local explainability, explanations via examples)?
- 49. Can the supplier provide clear guidance and explanations on how the results of the AI process should be interpreted?
- 50. Does the supplier outline the target user of the explanations (AI expert, domain expert, general consumer etc.) and ask them to describe any human validation of the explainability of the algorithms?
- 51. Does the supplier highlight key parameters and inputs to their AI model(s) and how they affect the outputs (i.e. sensitivities)?

5.2 Would you allow independent, third party audit(s) of the AI system? If your answer is no, please explain.

- 52. Is the supplier able to allow for external audits?
- 53. In the case that an external audit is not possible, justification must be provided.

5.3 Describe how you enable end-to-end auditability of the AI system.

- 54. Can the supplier describe what information is captured throughout the AI system and provide a taxonomy to describe the meaning of the information?
- 55. Is the supplier able to provide documentation related to the development and support of the AI system, for example, test reports, logs and quality criteria?

**Sample specification**

6.6 Explain how you will ensure the AI system or service does not drift from its intended purpose or outcome.

**Key considerations to look out for in the answers**

56. As algorithms are learning continuously after they are developed it is possible for them to drift from the original concept and deliver different results. Providers can be assessed on their approach to the following:

- What is the expected performance on unseen data or data with different distributions?
- Does the system make updates to its behaviour based on newly ingested data?
- Is the new data uploaded by users? Is it generated by an automated process? Are the patterns in the data largely static or do they change over time?
- Are there any performance guarantees/bounds?
- Does the service have an automatic feedback/retraining loop or is there a human in the loop?
- How is the service tested and monitored for model or performance drift over time?
- Is the supplier providing performance drift monitoring KPIs that prompt retraining if there are any unexpected changes?
- How can the service be checked for correct, expected output when new data is added?
- Does the service allow for checking for differences between training and usage data?
- Does it deploy mechanisms to alert the user of the difference?
- Do you test the service periodically?
- Does the testing include bias or fairness related aspects?
- How has the value of the tested metrics evolved over time?

# 7

## Interoperability and other standards

### Sample specification

7.1 Explain how your system or service conforms to specific international or local open interoperability standards or other relevant standards relating to cyber security, coding quality, safety, testing, accessibility and usability.

Examples are the IEEE standards as well as GDPR for personal identifiable information (PII).

### Key considerations to look out for in the answers

57. Does the supplier explain how the AI elements of the system or service operate with the following?

- Required data storage/access requirements?
- Operational monitoring/compliance tools?
- Standard system elements, including COTS, Operation support systems (OSS) and/or custom?

58. Can the supplier demonstrate the range, velocity and veracity of data and features that can/will be provided for wider potential use/developments?

- Detail interfaces (i.e. API) and integration dependencies (particularly OSS or custom elements)?
- Provide an approach for future interoperability requirements?

59. Does the supplier include business continuity management measures such as documentation and access to key processes and algorithmic steps for the AI model(s), where these are not provided as part of the normal delivery of the AI system?



## Due diligence on existing algorithms or COTS AI systems

### Sample specification

8.1 Describe the architecture of the AI system, including use of external COTS or open source elements and the function they provide in the AI system. This should consider the data used by each element of the AI system and how the output of that element was validated.

### Key considerations to look out for in the answers

60. If an AI system is based on an existing algorithm or will integrate with another functionality, the supplier should be able to describe the full nature of the system. For example, a COTS AI system could introduce unknown ethical risks if used improperly. Potential areas for consideration could be:
- Is the service or AI system based on COTS, OSS and/or legacy AI system(s)?
  - Which datasets was the service trained on?
  - Were there any quality assurance processes employed while the data was collected or before use?
  - Were the datasets used for training built for purpose or were they repurposed/adapted?
  - Were the datasets created specifically for the purpose of training the models offered by this service?
  - Are the training datasets publicly available?
  - For each dataset: Does the dataset have a datasheet or data statement?
  - Did the service require any transformation of the data in addition to those provided in the datasheet?
  - Was synthetic data used and how was this generated?
  - How were the models trained and when were they last evaluated for correctness?
  - How often are the models retrained or updated?
  - Did you use any prior knowledge or reweight the data in any way before training?
  - How is testing conducted by the service provider?
  - Which datasets was the service tested on (e.g. links to datasets that were used for testing, along with corresponding datasheets)?
  - Could these datasets be used for independent testing of the service? Did the data need to be changed or sampled before use?
  - Please provide details on train, test and holdout data and what performance metrics were used (e.g. accuracy, error rates, AUC, precision/recall)?

**Sample specification**
**Key considerations to look out for in the answers**

9.1 Explain how you will ensure the AI system or service does not drift from its intended purpose or outcome.

61. Is the supplier able to provide information on any existing training courses or documentation they have available?
62. Does the supplier include the creation of training materials as part of their offering bespoke AI systems?

9.2 Explain how you will ensure usability for non-trained staff.

63. Can the supplier describe the target user for the AI system, including expectations around their skills?
64. Can the supplier articulate how users can be trained to use and understand the AI/ML solution being implemented?
65. Can the supplier outline the types of skills required to support or use the AI system and the role types they would expect to see? For example, system admin, data scientist, end user.

9.3 Explain how the AI system will be maintained, how its accuracy and integrity will be sustained over time, and whether third party providers could be engaged for these activities.

66. Is the supplier able to describe the handover process in the case of a bespoke or COTS offering? This should detail:
- Accuracy metrics and thresholds to ensure the integrity of the AI system.
  - Maintenance processes and activities.
  - Support contracts.
  - Suitability for third party support.
67. Is the supplier able to provide a service agreement detailing the approach to AI in case the system is based on software as a service (SaaS)?
68. Can the supplier demonstrate scale deployment considerations for their AI model(s) (e.g. limit to data coverage, minimum model training requirements, system processing time sensitivities, etc.)?

**Sample specification**

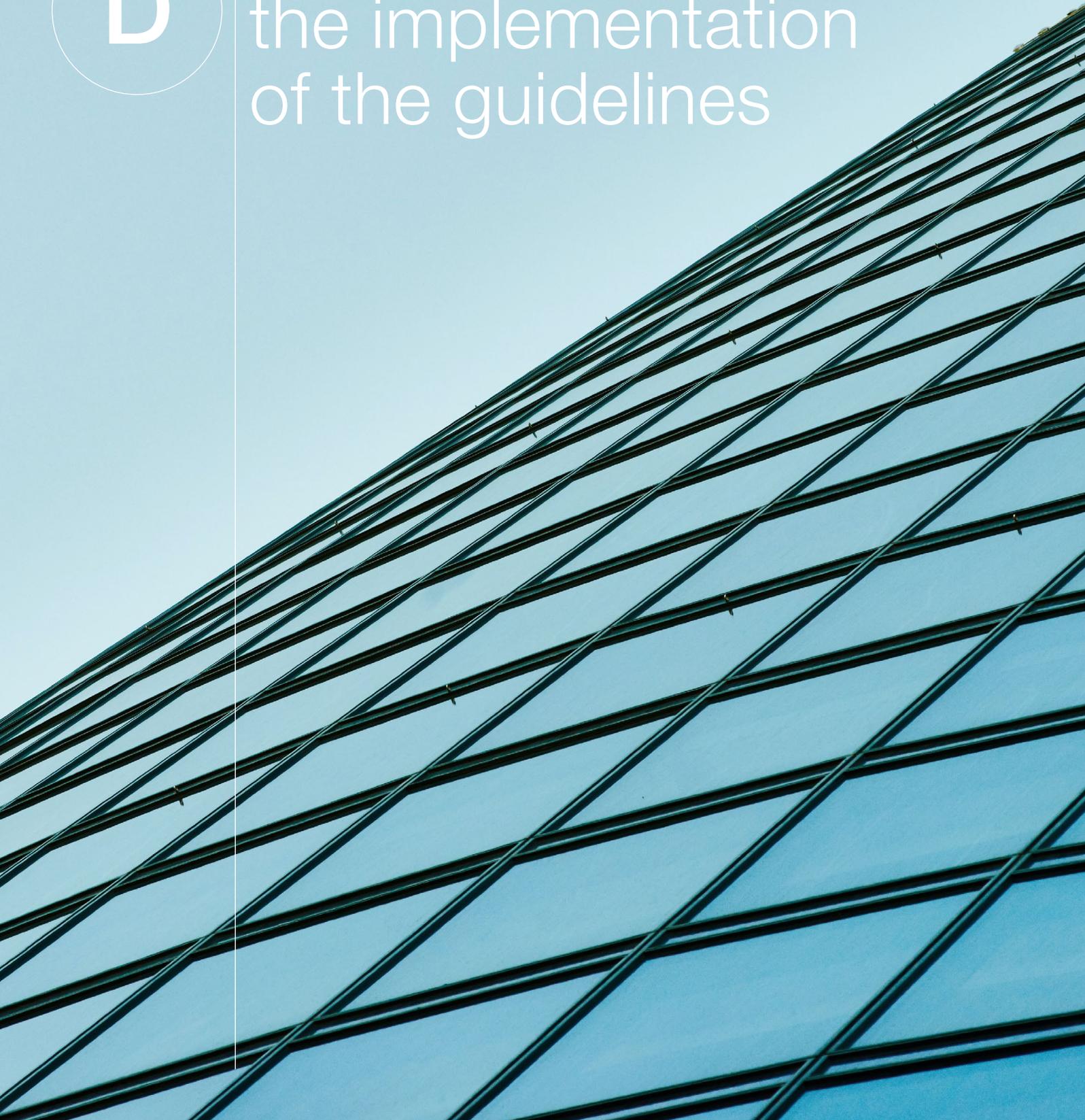
10.1 Can you demonstrate how you will assess the competencies, qualifications and diversity of the team that will develop and deploy the AI system?

**Key considerations to look out for in the answers**

69. Can the supplier outline how they are drawing on appropriate skills to be domain experts in the field of AI and in the area the AI system is to be applied?
70. Do the supplier skills set match standards referenced in the Skills Framework for the Information Age (SFIA framework)? <sup>6</sup>
71. Does the supplier highlight the importance of diversity in AI development and explain how this is considered in the composition of the delivery team and provide strategies to increase diversity in AI development if diversity requirements cannot be met by the immediate team?



# How to kick-start the implementation of the guidelines



## World Economic Forum AI procurement workshop templates

⬇ Day One

⬇ Day Two

⬇ Day Three





# Case studies



Below: Guwahati, India

1

# Case study India

Controller General of Patents,  
Designs and Trade Marks



“ The aim is to enhance efficiency, uniformity and consistency.

## Objective

The Indian Controller General of Patents, Designs and Trade Marks (CGPDTM) wanted to make use of artificial intelligence (AI), blockchain, internet of things (IoT) and other new technologies for its

patent processing system. The aim is to enhance efficiency, uniformity and consistency within issues ranging from inception of a possible IP to its enforcement.

## Why AI?

The patent processing system is a manually extensive and long process. As such, AI was considered a potential solution to modernize, automatize and strengthen the transparency of the process. It is also hoped that having a stable and efficient IP regime in the country encourages

innovation to achieve the country's industrial and economic development goals. The initiative was part of a larger government effort to explore the use of blockchain and AI in diverse areas such as education, healthcare, agriculture, electricity distribution and land records.

## Background

The CGPDTM is responsible for administration of all major IPR legislations in the country regarding patents, designs, trademarks, geographical

indications, copyrights and semiconductor integrated circuits layout-design. The office processes approximately 55,000 applications per year.

## Action

The procurement process was divided into two phases – the initial expression of interest (EOI) and request for proposal (RFP). The EOI was made available publicly on an existing e-tendering platform well-known to the business sector. The aim was to seek proposals as to how best to shortlist vendors for the purpose of hosting a limited tender. The participation of small and medium-sized enterprises was greatly encouraged through lower eligibility standards.

agency ensured that the vendor had the right skills set to develop and deploy the AI solution by demanding proof of certifications, references and past experiences.

The agency suggested different areas for the proposals (electronic data processing, screening, prior art searching, pre-grant opposition etc.) and companies were invited to pitch various solutions and technologies. The selection criteria for the EOI was based on track-record for similar projects, general qualifications of key staff, financial strength and accreditation and certifications. Hence, the

The RFP evaluation was much more focused on a specific type of solution and was based on technical bid evaluation, technical demonstration and financial bid. For the financial bid, the lowest bid was considered successful. Throughout the process, vendors were invited to submit queries for specific questions, which were answered at specific moments and made publicly available. It was agreed that the solution developed and furnished belongs exclusively to CGPDTM. The vendor had to grant a non-exclusive licence to access, replicate and use the application software, the custom software and any proposer owned software embedded in the systems.

## Ethical considerations

An important consideration for the deployment of the solution was the explicability of the search queries and the avoidance of biases. This was ensured by making the source code of the solution available to the public. The RFP also made clear

that any sensitive data provided would be hosted either on premises or through an API access<sup>3</sup> and would only be available to the successful vendor for testing/development phase. Furthermore, it was clarified that no data would be hosted outside India.

## Lessons learned: Which guidelines were harder to implement?

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**“Support an iterative approach to product development.”**

**“Assess whether relevant data will be available for the project.”**

The “Eligibility and Financial Criteria” methodology used to select a vendor was hard to understand for many RFP participants. One aspect that led to confusion was the required accuracy of 75% for developed models. The RFP did not give a clear definition of “accuracy” and did not provide historical data for training and testing of the models. As machine ML/AI models improve accuracy over time as they learn and get better, it was hard for the RFP participants to develop a 75% accuracy without access to relevant data. In addition, this evaluation criteria lacked transparency and didn’t support an iterative approach to product development. Following the concerns raised by the participants, the CGPDTM lifted that requirement.

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**“Develop an understanding of the skills that are needed to effectively acquire and maintain an AI-powered solution, before starting the procurement process.”**

Successfully designing and deploying AI in an organization as big and complex as the CGPDTM was a major technical and human challenge. Assembling a team with experience in change management and technical expertise on integration with existing software and datasets could have helped to better navigate the procurement and implementation process.

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## Success factors: Which guidelines were successfully implemented?

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**“Aim to include your procurement within a strategy for AI adoption across government and learn from others.”**

This project was part of a larger government of India-wide effort to adopt and enhance the use of latest technologies and as such, senior government functionaries were very active in making the procurement process a success. This strong leadership from the government ensured that the right resources were employed and the process moved forward.

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**“Reach out in various ways to a wide variety of AI solution providers.”**

**“Create the conditions for a level and fair playing field among AI solution providers.”**

While providing opportunities to various firms to compete, the public EOI also boosted innovation and the diversity of the proposed solutions. Newly established providers were also given the opportunity to compete for this public-sector contract through lower requirement standards.

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**“Focus on developing a clear problem statement, rather than on detailing specifications of a solution.”**

An extensive and clear description of the IPO workflow and use-cases for AI made it easy for participants to identify opportunities. Documenting user needs and challenges for each stage of patent applications was crucial for AI system providers to understand the problem.

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**“Define if and how you will share data with the vendor(s) for the procurement initiative and the subsequent project.”**

The RFP was clear on data governance during and after the procurement initiative. The governance approach specified who would be granted data access, the purposes for which a vendor would be authorized to use the data and the minimum requirements for hosting/reviewing the data.

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**“Require the successful bidder(s) to assemble a team with the right skills set.”**

Evidences of skills and qualifications of key team members were required in the initial EOI. Evidence of bidder’s resources for deploying the solution were also assessed and were part of the decision-making criteria.

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**Below:** Bugsby's Way,  
London, United Kingdom

2

# Case study United Kingdom

Driver & Vehicle Standards Agency



“ The department only became aware of the power and opportunities of applying AI when it received the responses to the invitation to tender – and, at a more detailed level – once it started working with the partners.

## Objective

The Driver and Vehicle Standards Agency (DVSA) wanted to make use of digital technologies to ensure that vehicle standards are enforced while at the same time saving time and costs.

A data-driven approach should help the agency to conduct intelligent inspections of authorized garages conducting the vehicle standards test.

## Why AI?

The team held a lot of data that it couldn't use effectively. The testing was resource intensive and the previous process did not allow for targeted inspections. Clustering techniques offered insights

that were previously not available. This helped to make predictions that now support a more targeted approach to inspections.

## Background

The DVSA is an executive agency of the United Kingdom Department for Transport, which among other things supervises the MOT scheme, a vehicle standards examination, ensuring that authorized garages carry out tests to the correct standards. This examination, referred to as “the MOT”, assesses vehicle safety, roadworthiness and exhaust emissions and is required in the UK for most vehicles over three years old and used on anything that can be classified as a road. Each year, 66,000 testers conduct 40 million MOT tests in 23,000 garages. The inspection of the authorized garages was resource intensive and the knowledge was limited to effectively target inspections of these garages.

ways, including quality of the service to the end user (motorist), test quality, reduce fraud risks and improve efficiency. The DVSA had insufficient capacity to do this so chose to procure two digital partners. As well as delivering some of the improvements (in consort with DVSA as part of blended agile teams) the partners would also develop the department's in-house skills.

The DVSA made the decision to further invest in the MOT to improve the service in a number of

The DVSA released an invitation to tender (ITT). The AI aspects of the work were part of this larger contract for digital transformation and the department only became aware of the power and opportunities of applying AI when it received the responses to the invitation to tender – and, at a more detailed level – once it started working with the partners (as part of options for solving business challenges).

## Action

During the procurement process the DVSA ensured that the ITT set out clearly what challenges it wanted to solve and what outcomes it sought. The DVSA used the Digital Outcomes and Specialist Framework, which is a framework agreement that focusses on the digital transformation of public sector services.<sup>9</sup> The ITT did not ask for AI as a technology, but laid focus on the use of technologies that would deliver the most effective outcome. The aim of the procurement effort was to contract digital services and skills that would help the team to identify and deploy the right tools and systems to address the delivery challenges, in particular improving the DVSA inspection of authorized garages that conduct MOT tests. During the ITT stage, pricing arrangements were kept simple with partner effort paid on a time and

materials basis at agreed rates. It was required that all IP would be owned by the DVSA.

The project started with a set of mini discoveries, which enabled the agile nature of the work. These covered a number of areas and included the following:

- Improving MOT test quality through better supporting testers
- Better enabling the DVSA to know which garages presented the greatest risks of testing poorly
- Identifying those applying to be involved in MOT that may present risks to the integrity of the MOT service

In collaboration with the supplier, the DVSA applied a clustering model against garage test data from a three-month period.<sup>10</sup> The clustering model grouped MOT-authorized garages based on the behaviour they show when conducting MOT tests, such as the test duration, time of test and result of inspection (against expected). The DVSA created a risk (of testing incorrectly) score for each garage, which allowed the department to rank garages and their testers and helped it identify regional trends. The model was validated against those who had been identified as doing things incorrectly, ensuring that the model could learn what behaviours were good indicators of wrong-doing.

An important consideration was the ability to explain the model and the human in the loop. It is important to explain the outcome of the risk rating without losing the integrity of the test. Having a human

in the loop who interrogates and decides to take action on the risk score was crucial to make the use of AI successful. All the data used for the AI system was data that was already collected by the DVSA and it did not include a great amount of sensitive data. Suppliers had visibility of some data, but not off-site access.

The lifecycle management of the tool was not fully factored in upfront and became a challenge once the technology was developed. The DVSA team identified this as an issue and worked with suppliers to put together a plan to bolster the skills of the department's continuous improvement team. This ensures that the system continues to work effectively and meets users' needs, as well as technical support that addresses issues related to hosting and live service failures.

## Impact

The DVSA can now target its resources at the garages and testers with the highest risk score. By identifying areas of concern in advance, the examiners' preparation time for enforcement visits has fallen by 50%.

There has also been an increase in disciplinary action against garages, meaning standards are now being better enforced. As more garages are delivering better MOT standards, there are more cars on the road that comply with roadworthiness and environmental requirements.

50%

the fall in examiners' preparation time for enforcement visits



## Lessons learned: Which guidelines were harder to implement?

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**“Support an iterative approach to product development.”**

It was important to find the right balance between agile delivery and the focus on price in the evaluation of the proposals. Since prices and timelines might shift due to the agile nature of the work, you must ensure that you reflect this in the scoring of the invitation to tender and not only focus on the fixed lowest price of the delivery.

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**“Consider during the procurement process that acquiring a tool that includes AI is not a one-time decision; testing the application over its lifespan is crucial.”**

Considering the life-cycle management and its impact on procurement revealed to be a challenge. The earlier the focus on the maintenance of the solution and the ongoing management of the AI system, the better it is for the project delivery.

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## Success factors: Which guidelines were successfully implemented?

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**“Make use of innovative procurement processes to acquire AI systems - encourage collaboration between different bidders.”**

It was important to rely on a team of suppliers for project delivery, rather than just one supplier. Partnering with three suppliers and asking them to deliver the project in collaboration ensures that all relevant skills were available and checks and balances were in place. Regarding AI delivery, one supplier developed the AI model and another supplier helped to test the model and ensured that it worked properly.

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**“Focus on developing a clear problem statement, rather than on detailing specifications of a solution.”**

The requirements in the ITT focused on outcomes rather than the means of how to achieve those outcomes. This gave vendors the flexibility to select the technology that they found fit for purpose and ensure that the solution was innovative and effective.

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**“Work with a diverse, multidisciplinary team.”**

The agency worked actively on upskilling internal teams and recruiting experts into the team where needed. This helped the agency to become a better customer for AI systems.

The delivery was supported through a close collaboration with the suppliers. During the project delivery the DVSA worked closely with delivery partners. Key to this was thinking as a single team and as partners, not contractors. At a practical level, this meant being open about the problems that needed to be solved, the challenges that different solutions may present and the costs of different options. This experience showed that openness brings real reward in getting value from the partnerships.

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**“Engage vendors early and frequently throughout the process.”**

Extensive pre-market engagement helped to better target potential AI system providers. The DVSA hosted a supplier open day to explain the challenges that the agency faces to suppliers and gather initial ideas of how and with the help of which technologies to address these. After the initial tendering process, shortlisted suppliers were asked to present their approaches to the DVSA, which improved the ability to evaluate the different delivery approaches.

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3

# Case study United Arab Emirates

Dubai Electricity and Water Authority



“ The ability of machine learning to leverage a range of enterprise information and improve its interactions combined with the chatbot’s ease of interaction proved to be an ideal means to meet the data access needs.

## Objective

To enable an efficient and comprehensive procurement process for digital and AI solutions, DEWA's top management had directed their team to demonstrate leadership on this topic. By identifying use-cases where the new procurement guidelines could be applied, DEWA's aim was to work on a pilot which could be then scaled across UAE and globally.

One of the use cases identified was the need for senior management at DEWA, to access reports and dashboards on a daily, weekly, monthly and quarterly

basis to review strategic performance indicators. These dashboards and reports are available on different platforms and some of them take a long time to generate and prepare before they can be presented to top management. As a result, DEWA was looking for a faster and easier way to access the required data to make correct and timely decisions. A technology was needed that was capable of understanding management's enquiries, providing the right data in a convenient and timely way and learning from the enquiries made.

## Why AI?

The use of AI to solve complex challenges was supported by the state's National AI Strategy, which seeks to position the UAE as an AI world leader by 2031. DEWA also has a vision to become a globally leading sustainable innovative cooperation, and its strategic objective is: "Enabling AI and digital technologies". To achieve these goals, DEWA defined three main pillars for its AI adoption. The first is Rammas for You, which covers customer-facing services. The second is Rammas at Work, which seeks to augment the work environment with AI tools, and the third is and the first is Powered by Rammas, which adds AI to DEWA's core business assets.

In January 2017, DEWA launched the Rammas Virtual Agent, a chatbot that answers customers' enquiries and is powered by AI, as part of the Rammas for You pillar. Following the virtual agent's success, DEWA began considering using the same concept to meet management's data access needs. The ability of machine learning to leverage a range of enterprise information and improve its interactions combined with the chatbot's ease of interaction proved to be an ideal means to meet the data access needs.

## Background

Dubai Electricity and Water Authority (DEWA) is a public utility founded on 1 January 1992, by a decree issued by the late Sheikh Maktoum bin Rashid Al Maktoum to merge Dubai Electricity Company and Dubai Water Department. DEWA's strategies and achievements are inspired and driven by the vision and directives of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai. Today, DEWA provides services to over 900,000 customers across Dubai.

DEWA was the 1st government organisation in the UAE to launch an online AI chatbot in 2017. The chatbot called Rammas communicates in both Arabic and English with customers and respond to their enquiries. AI helps DEWA's customers with

services, such as the Smart Response service on DEWA's smart app and website. This allows early self-diagnosis of technical interruptions at home, reducing the necessary steps to deal with complaints and follow-ups.

DEWA conceptualised the AI procurement guidelines with the World Economic Forum and Dubai Future Foundation to further drive cooperation between the public and private sectors, and to enable governments and companies to make their procurement processes as efficient and transparent as possible by employing a multi-stakeholder approach. DEWA implemented a framework that allowed for feedback and finding best practices and standards to govern AI technologies procurement process.

## Action

DEWA sent a request for proposal (RFP) to suppliers. Bidders had a month to respond, after which there was a window for bidders' questions and a bidder's conference to answer further questions.

The final evaluation of the solution proposals used seven criteria with different weights. Technical assessment and AI capability were the most important, and the proposed solutions were evaluated with a demonstration or evaluation of

a prototype from each bidder's solution. DEWA also evaluated project governance, deliverables, business value, solution dependency and vendor background, and awarded the contract to the highest scoring proposal evaluated by the procurement committee, which comprises important stakeholders and AI specialists.

After this, the source code for the solution was shared with DEWA. This is an open source system

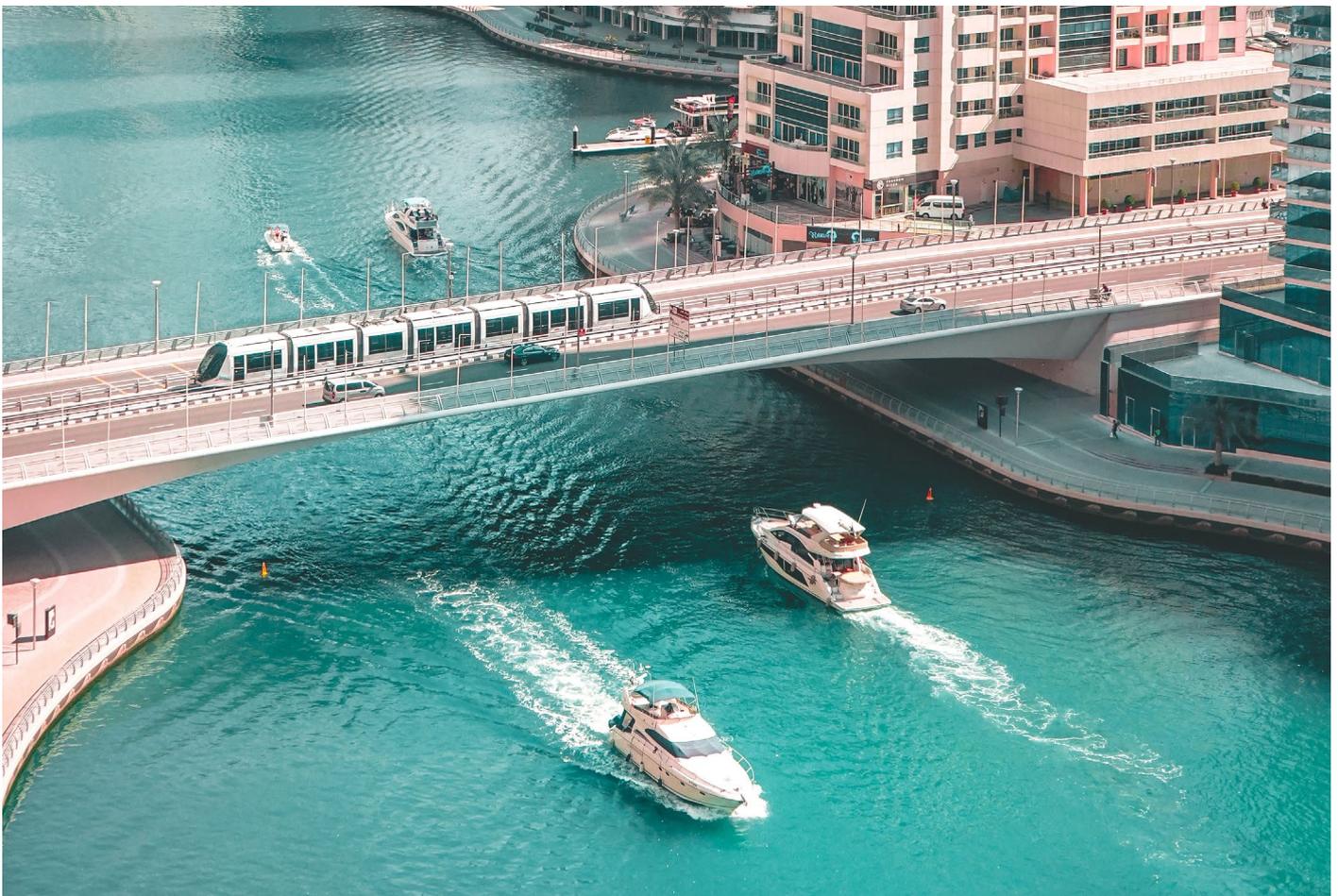
## Ethical considerations

DEWA is committed to protecting customers' and stakeholder's data by adopting and complying with relevant UAE legislations and Dubai Government applicable regulations. This includes Federal Law No.1 for 2006 on Electronic Commerce & Transactions; Federal Legal Decree No. 5 for 2012 on combating cyber-crime, and the Regulatory Framework for stored values & Electronic Payment Systems (EPS Regulation), which regulates business offering electronic payment services.

DEWA also adheres to the Dubai Data Law, open data, shared data, data confidentiality and data sensitivity policies. DEWA also put in place internal measures to secure customer data. It drafted a contract that clearly stated the requirements to prevent sharing its information with any external parties; and that such data must always reside within DEWA's assets.

and will be developed from scratch and hosted by MORO, a digital platform launched in 2018 to support the Dubai 10X initiative. MORO provides hosting and data storage services and cloud-based digital services management. The supplier contract took into account additional requirements, such as training DEWA employees to maintain and improve it to ensure continuity and the proper communication of knowledge, to enable DEWA to further expand its capabilities.

The solution works in tandem with multiple internal datasets related to strategic KPIs, employees' statistics, organisational data and sensitive information. The solution had to run on a private cloud within the UAE in adherence with the Dubai Data Law due to this sensitivity because it cannot be shared or processed externally. It was important that sensitive datasets remain protected at all times. To address this, the roles and responsibilities of each user were applied within the solution, and controlled by pre-defined access levels. There was considered to be no issue with data transparency or the ability to understand the AI model as the AI solution is only accessing data without any modification.



## Lessons learned: Which guidelines were harder to implement?

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**“Make use of innovative procurement processes to acquire AI systems.”**

The procurement process took five months from the business case initiation until the announcement of the preferred bidder. The team considered this would take too long. As a result, DEWA developed a new procurement track specific to AI in cooperation with the World Economic Forum and Dubai Future Foundation. This track was benchmarked by Dubai Future Foundation to apply similar techniques to specifically expedite the adoption of AI tools within DEWA.

The new procurement track consists of a set of key milestones including:

- Establish a senior AI Committee which includes champions from multiple departments and specialities to guarantee a 360-degree approach when evaluating AI RFPs and aligning them with AI Procurement Guidelines to ensure the adoption of the Framework, define an AI pre-approved supplier list, thus, enhance the overall AI procurement process and accelerate the adoption of AI technologies in DEWA.
- Create the DEWA AI Definition to have a clear description for AI-use cases within DEWA, avoid confusion with other technologies, and facilitate the overall process.
- Create AI RFP templates. Early market engagement will also be a key component of this new track, as the procurement team will constantly be on the search for new AI vendors via conferences and info sessions.

## Success factors: Which guidelines were successfully implemented?

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**“Focus on developing a clear problem statement, rather than detailing specifications of a solution.”**

DEWA implemented the first pilot for a virtual agent called Rammas, in 2016 and then launched the first version of the live solution in January 2017. Nine months later, the UAE AI Strategy was announced with a clear vision ‘to be an AI World Leader by 2031.’

The scope of the project was clear from the start as it was part of the AI roadmap initially. This made the process particularly efficient by leading to more relevant vendors’ responses and an increased probability of success.

**“Aim to include your procurement within a strategy for AI adoption across government and learn from others.”**

DEWA embedded AI in its strategy and developed a separate AI functional strategy that has been aligned and cascaded from the UAE National AI strategy. The functional AI strategy covers 6 main pillars, including AI in stakeholder happiness, AI in technology, AI in sustainability, AI in operations, AI investment, and enabling AI.

DEWA also responded immediately to the National AI Strategy by building a five-year roadmap to augment its work with AI tools. Moreover, DEWA is an active member of the Smart Dubai AI Advisory board and works closely with the Smart Dubai Office and other government entities for knowledge sharing and delivering new innovative services powered by AI to Dubai’s population.

For instance, the Rammas Virtual Agent content is integrated with Smart Dubai Office’s Virtual Agent, called Rashid, which is available on the Dubai Now smart application to ensure information availability and to maintain a seamless customer experience.

**“Work with a diverse, multidisciplinary team.”**

DEWA organised, in collaboration with Dubai Future Foundation, and World Economic Forum Fourth Industrial Revolution Centre, a four-day workshop in October 2019 about Artificial Intelligence (AI) Procurement guidelines.

This was part of DEWA's efforts to position the UAE as a global leader in AI by 2031 in line with the UAE Strategy for Artificial Intelligence.

One of the main outcomes of this workshop was to form a senior AI committee within DEWA, which includes champions from the Contract and Procurement department, an AI Team, an Intellectual Property Team, the BRM Team, and the PMO Team. This committee is responsible for evaluating the AI RFPs and to align them with AI Procurement Guidelines, to ensure the adoption of the Framework, by defining an AI pre-approved supplier list, improving the overall AI procurement process, and accelerating the adoption of AI technologies in DEWA.

This ensured a comprehensive evaluation of the proposed solutions and a good understanding of the issues at play.

**“Define if and how you will share data with the vendor(s) for the procurement initiative and the subsequent project.”**

DEWA adheres to the Dubai Data Law, open data, shared data, data confidentiality and data sensitivity policies. Moreover, DEWA has internal measures to control data privacy. Customers' data is not shared with any external parties and the data always resides within DEWA's Assets.

**“Ensure that you have proper data governance mechanisms in place from the start of the procurement process.”**

DEWA's security team is making sure that the data provided to the vendors is secured, encrypted and in compliance with Data Residency Law of UAE and DESC (Data Electronic Security Centre).

The Personal Identifier Information (PII) data was removed from the vendors' dataset and the rest was encrypted. This gave the vendors access to the structure of the data, which is all that was needed to build a prototype.



4

# Case study Kingdom of Bahrain

Information and eGovernment Authority



After discussion with different solution providers and evaluation of the first Proofs of Concept, it became clear that AI could add value to the proposed solution by using it for predictive analytics.

## Objective

Decisions about advanced studies and career pathways in Bahrain have been traditionally based on strong cultural and social imperatives to pursue pure academic qualifications for traditional white-collar jobs, irrespective of whether there is labor market demand from those sectors. This social norm is compounded by the fact that there is no authoritative source of labor market intelligence on which prospective employees can base their study and career decisions. Together, these factors give rise to ill-informed decision-making, which has a detrimental impact on students, employers, and the government.

Therefore, the Labour Fund (Tamkeen) in collaboration with the Information and eGovernment Authority (iGA), and other government institutions, decided to develop an Employability Skills Portal (ESP) to serve as a repository of labor market information. This portal could be used by prospective employees to make informed career decisions and by educational institutions to tailor their programs to market demand. The portal needed a technology capable of cleaning and integrating data from multiple sources, finding correlation between the data and making prediction on the direction of various trends and indicators.

## Why AI?

The use of AI was not a requirement at the start of the project. However, after discussion with different solution providers and evaluation of the first Proofs of Concept, it became clear that AI could add value to the proposed solution by using it for predictive

analytics. In addition, the use of AI was in line with the vision of higher management and the Kingdom of Bahrain's leaders to support digital transformation and the use of modern technology.

## Background

The Information and eGovernment Authority (iGA) of Bahrain facilitates many public services related to the IT sector. It aims to achieve cyber security integration between the public sectors institutions,

as well as to work on implementing the knowledge in order to support decision making, creativity and encouraging innovation in the areas of public services and institutions.

## Action

As the portal would be based on the cloud, the project floated through an existing special procurement track for cloud technologies. This track accelerates the implementation of cloud projects by by-passing traditional tendering processes. In order to do that, this innovative procurement track offers access to dedicated funds for cloud technologies and a list of pre-approved vendors selected for their internal knowledge, links with global technology leaders and financial capabilities. The process started with a first, free of charge, Proof-of-Concept (POC), from different solution providers. These POCs were evaluated through an agile methodology until they reached an acceptable level of satisfaction by end users, the labor market, and internal users and iGA technical team. Each POC was then given a score based on both users' evaluation and a financial bid. Most weight was given to the ability to reach expected end results and user needs. The highest

scoring vendor solution was chosen to move to the next phase; the development of a complete POC with costs covered by iGA. If the required level of satisfaction from the final POC was not met, iGA would select the next highest scoring vendor solution to move to the second phase until the required level of satisfaction was reached and the contract was awarded. This iterating phase took about two months to complete.

The solution was agreed to be fully owned by iGA and its internal technical team was involved from the start in the implementation process to ensure a proper handover of the solution. iGA technical and management team also made sure to benefit from the bidders' knowledge through weekly meetings and close collaboration to better understand the implication and use of AI.

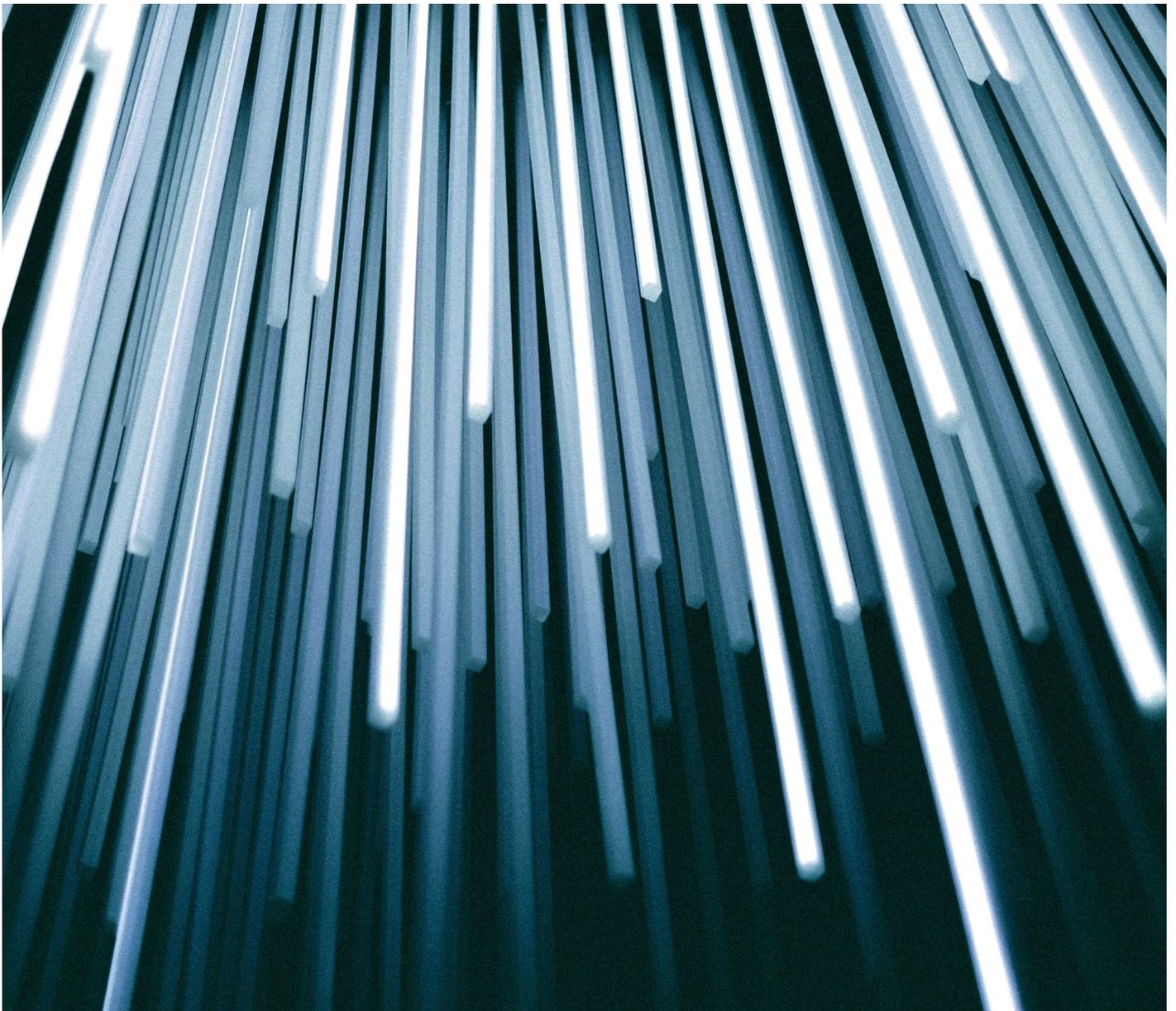
## Ethical considerations

The Data Protection Law of Bahrain, which regulates the use of personal data, was taken into consideration for the project and vendors had to comply with it. However, the project also involved other types of data not covered by the regulations. The use of various datasets from different government entities was an important issue because of the lack of regulations and governance for data sharing between organizations and the lack of governance for non-personal data. Hence, a task force led by iGA and top management from each involved organization was created. The role of this task force was, in part, to serve as a governance body for data sharing and also to gain an in depth understanding of each dataset and the biases that could emerge when using AI. Indeed, the best way to gain insights on the nature of each dataset and their potential bias was to partner with the providers of these datasets. iGA also appointed an external

legal consultant to conduct an impact assessment of the use of data before starting the project. The goal was to understand if the way each dataset would be used could create legal or ethical issues.

Concerning data sharing with the vendors for the POCs development, the vendors had access to the entire population to train their models, but synthetic data was used to mask personal information. The synthetic data was generated in such a way that the real aggregate results were preserved. In addition, the vendors could only access the data through temporary iGA internal accounts.

The AI model explainability was addressed by requiring the successful vendor to provide a non-technical description of the model that would be available to internal users.



## Lessons learned: Which guidelines were harder to implement?

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**“Create the conditions for a level and fair playing field among AI solution providers.”**

The accelerated cloud technology procurement track being a new process, the list of pre-approved vendors was not fully developed at the time of the project. Work is being done to expand this list and give access to new innovative vendors.

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**“Make use of innovative procurement processes to acquire AI systems.”**

The introduction of payment for the development of the second POC was a new concept that slowed the process as it was hard to get approvals. Moving forward, instead of requiring approval for each new payment, the accelerated cloud technology procurement track will include lump-sum funds that can be allocated as needed for each procurement project.

## Success factors: Which guidelines were successfully implemented?

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**“Focus on developing a clear problem statement, rather than on detailing specifications of a solution.”**

The project didn't start with AI in mind. The need for a specific outcome was defined and the technical evaluation of the vendors' solution was focused on their capacity to meet the desired outcome. Hence, the project was open to a variety of technical solutions and was able to select the most appropriate technology.

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**“Conduct an initial AI risk and impact assessment even before starting the procurement process, ensure that your interim findings inform the RFP, and revisit the assessment at decision points.”**

An external consultant was mandated to evaluate the potential impacts of the use of AI on the different datasets. Potential biases were identified as well as the mitigation strategies.

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**“Conduct a review of relevant legislation, rights, administrative rules and other relevant norms that govern the types of data and kinds of applications in scope for the project.”**

Relevant regulations were identified and communicated to the vendors. In addition, blind spots within the current regulations were identified and strategies were put in place to address them. A government task force was formed to identify best practices and establish consensus on the use, processing and transfer of non-regulated data.

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**“Ensure that you have proper data-governance mechanisms in place from the start of the procurement process.”**

**“Highlight the technical and ethical limitations of using the data to avoid issues such as bias.”**

A government task force comprised of top management from each organization where data would be collected was created. Hence, the vendors and iGA team were able to meet with the data providers and truly understand potential biases and limitation to the quality of each datasets in order to avoid misleading results. Vendors were then able to adapt their model accordingly and address these shortcomings.

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**“Ask the AI provider for knowledge transfer and training to be part of the engagement.”**

iGA internal technical team was involved from the start in the implementation process to ensure a proper handover of the solution. iGA technical and management team also made sure to benefit from the AI providers' knowledge through weekly meetings and close collaboration to better understand the implication and use of AI.

5

## Case study Splunk Inc.

Key considerations for successful adoption of AI as an added capability/functionality with an existing supplier and a system already in use



There are multiple ways of procuring and adopting AI technologies; they can be built from scratch, added as capabilities to commercial off-the-self (COTS) systems or acquired directly as a service (SaaS). Often solutions require a mix of these approaches to be successfully adopted. For most operational organizations AI capabilities are added iteratively to an existing solution or procured via an existing supplier as an added functionality to a product or service. When adopting AI as part of an

existing platform contract without going through an independent AI procurement process, some guidelines are more relevant than others.

Three important factors, highlighted in the guidelines, form the basis of success for public-sector agencies adding AI-capabilities to systems already in use. These have emerged from Splunk's experience supporting and working collaboratively with public-sector entities:

## Key guideline for AI as an added capability/functionality

## Key factor to consider to successfully implement the guidelines

**“Define the public benefit of using AI while assessing risks.”**

### End users' background

When considering the benefits that can be realized with an AI system, understanding the end-user audience is of great importance. The end-user's understanding of pertinent mathematical principles (such as probability) and how they are likely to interpret and apply the output of the AI system should be considered. This will help inform the type and granularity of outputs (e.g. visual charts, key metrics etc.) that should be selected, how fast new techniques can be adopted and/or accepted and what cautions, if any, are desirable for the particular use case.

**“Articulate the technical and administrative feasibility of accessing relevant data.”**

### Understanding data assets

Finding and understanding what data an organization holds and how it may be accessed, combined and processed in accordance with the law and organizational norms will help you determine project scope – what can be achieved with the data and with what controls. According to recent research, 97% of public-sector agencies agree that they must improve their ability to ingest, index and cross-correlate disparate data sets to optimize public policy outcomes.

**“Highlight the technical and ethical limitations of intended uses of data to avoid issues such as historical data bias.”**

### Data literacy

AI technologies can be complex and therefore, to be successful in the identification of technical and ethical limitations, it is critical that an organization's leadership and operations team be “data literate”. This does not mean each team member must become a data scientist, but they should understand the underlying mathematical principles (i.e. probability, accuracy, sampling etc.) and gain an appreciation of the different benefits and limitations of the main ML techniques. Innovation and education go hand in hand. Without a proper data and knowledge foundation, users will not be able to capitalize on the advances in automation and decision-making capability provided by AI.

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private companies, governments, civil society organizations and academia to understand public-sector procurement of AI technology, identify challenges and define principles to guide responsible and ethical procurement. The opinions expressed herein may not correspond with the opinions of all members and organizations involved in the project.

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# Endnotes

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*Unlocking Public Sector AI*

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# AI Procurement in a Box: Challenges and opportunities during implementation

TOOLKIT  
JUNE 2020

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## Background

The World Economic Forum's Centre for the Fourth Industrial Revolution launched the project Unlocking Public Sector in AI, which offers AI procurement guidelines for government and public-sector organizations in November 2018. The Forum's goal is to help officials better understand this rapidly developing technology and mitigate potential risks. The guidelines are being piloted with government departments and agencies around the world, beginning with Bahrain and the United Kingdom, along with the Dubai Electricity and Water Authority in the United Arab Emirates.

The pilots have centred on workshops that focus on analysing the guidelines in the light of a specific potential use case of AI to test their applicability and gather feedback. The main aims of the workshops have been to:

- Gather feedback on the guidelines
- Test the guidelines in an example scenario
- Move from theory to practice and develop a roadmap for action

## What is the purpose of this document?

This document is an overview of the key findings from the workshops conducted in Bahrain, the United Arab Emirates (UAE) and the United Kingdom (UK), which focused on moving the guidelines from theory to practice.

The document provides insights, identified by workshop participants, of key themes and aspects to consider when implementing the guidelines.

## Discussions: Moving the guidelines from theory to practice

Workshop participants explored various themes related to the government's use of AI and how procurement plays a role in government adoption of the technology. The themes identified as priorities were:

- Data
- People: Skills, culture and leadership
- Procurement processes
- Ethics: Accountability, liability, transparency

# 1

# Data

Participants identified data governance as a major challenge for many public-sector organizations looking to adopt AI. This related to the foundational technology as well as the process required to successfully manage and leverage data. Levels of data maturity vary throughout government agencies, with different agencies finding themselves at different points in the data journey.

**The discussions identified the following as key initiatives to move from theory to practice and apply the guidelines:**

1. Exploring the potential and dos and don'ts of data sharing as part of the procurement process: While the benefits of sharing data with vendors during the procurement process were recognized, it was acknowledged that it would be challenging given the current regulatory environment, but trials and pilots could be considered to explore the potential and share best practices. Participants also identified that more broadly, sharing data between government agencies is necessary to address complex policy problems, but is currently a significant challenge. In the UAE, Dubai's answer to this problem is provided by Smart Dubai, a government agency tasked with improving the experience of living and visiting Dubai. Smart Dubai is creating the infrastructure and processes that enable government agencies to share data. While the initiative is relatively young, it is an example of tangible government action aimed at increasing data sharing.
2. Mapping opportunities related to third-party data: More analysis and guidance is needed on how to obtain and utilize third party data, whether it is procured or acquired through partnerships.

3. Ensuring data integrity: Organizations need to be able to trust their data. This requires data management practices that ensure the integrity of data. Practices can be borrowed from red teaming (i.e. data monitoring by different individuals/systems) also known as penetration to stress-test data. The exercise would consist of having data-savvy resources (beyond than those that created the data) attempt to derive personally identifiable information (PII) from the merged data set.
4. Setting out a national data governance strategy and providing public entities with an adoption roadmap: Since data governance is a cross-cutting theme that is important for every government entity, and entities need to share data with one another, it is crucial that entities within a country share a common approach to data governance. The UK government is working on a National Data Strategy<sup>2</sup> and a national data standards framework. It is likely that departments and agencies' efforts to develop data strategies will increase once the standards are in place.
5. Developing and implementing data action plans within agencies and teams: Data action plans tailor national strategies for the needs of specific groups at different levels (e.g. agency, department, team, sector etc.). An example is the Joint Rail Data Action Plan published by the UK government in August 2018.<sup>3</sup> It is a framework for government and the rail industry to foster greater data openness.

“ In the UAE, Dubai's answer to this problem is provided by Smart Dubai, a government agency tasked with improving the experience of living and visiting Dubai.

# People: Skills, culture and leadership

AI change management also includes business process engineering.

Leadership, skills and culture are key to the implementation of the guidelines. AI change management, skills development and partnership between the public and private sector were the key sub-themes that were discussed. It was highlighted that the skills gap is potentially much bigger for AI procurement than for conventional procurement because it not only calls for multidisciplinary teams, but also very specific technical expertise. Mindset shifts and a greater appetite for risk are also needed to drive innovation and trial emerging technologies in a public-sector context. AI change management also includes business process engineering. Processes need to be effectively analysed and studied so that they can be improved and streamlined for optimum efficiency in terms of performance and cost. Since most likely you are not starting from scratch with a blank sheet of paper it is crucial to evaluate the process, analyse data and gather evidence to ensure that new considerations are aligned with the overall approach.

The discussions identified the following as key initiatives to move from theory to practice and apply the guidelines:

- **Putting a greater focus on knowledge sharing throughout different professions and the public and private sectors:** Knowledge and best practice sharing could be a key addition to other traditional up-skilling measures. It was suggested that the establishment of a multistakeholder group that provides knowledge sharing of AI projects throughout government would support this.
- **Focusing on bringing in experts:** Teams throughout government need to attract, develop and retain the people and skills required to achieve government transformation.
- **Up-skilling senior civil service officials in AI:** Provide training to ensure that public servants are aware of the opportunities and challenges of AI in the public sector, and can shape change and make effective decisions. Participants suggested that given the importance of leadership support, training can start with senior officials.
- **Obtaining strategic direction and support from senior leadership:** It is important to train senior leaders to better understand AI and develop and communicate an AI vision for their organization. Leaders must support their teams in increasing the impact of AI technologies.
- **Ensuring that everyone in the organization understands the benefits and impact of AI adoption:** When focusing on AI adoption it is important that there is an initial focus on quick wins for AI deployment and that it helps staff with their daily work. This includes demonstrating the benefits and measuring the impact of models in use.
- **Working in partnership with private sector organization:** Public-private partnerships could ensure that change is managed effectively. This could be done through proof of concepts that demonstrate the validity and value of AI solutions, or through programmes such as fellowships, secondments, hackathons and workshops that showcase the ability of AI to enable government to accomplish its goals.
- **Bringing together the right skills to evaluate tenders with ethical considerations:** It is important to have ethics skills as part of the procurement team. If they are not available in-house they should be built or borrowed. For example, in the case for the UK bodies such as Centre for Data Ethics and Innovation<sup>4</sup> or the Alan Turing Institute<sup>5</sup> can assist.

# Procurement processes

To move from theory to practice as well as apply the guidelines determined by the participants, the following should be considered:

**The discussions identified the following as key initiatives to move from theory to practice and apply the guidelines:**

- **Developing a new procurement vehicle for AI:** Current procurement frameworks do not actively enable the agile nature of AI development and deployment nor do they address ethical questions. It was suggested that the need for separate new AI vendor lists or frameworks be considered as well as whether all tech procurement approaches should include ethical evaluation criteria by design. Dynamic purchasing systems, such as the emerging technology marketplace SPARK<sup>6</sup> in the UK, could be used to increase the supplier base and pre-qualify ethical and innovative providers.
- **Building ethics-by-design into the procurement process:** It is important to define the ethical requirements of the tool. It is also helpful to determine at which points during the procurement process you should perform an ethics assessment. For example, this could be done as part of pre-qualification of suppliers for a procurement framework or as part of each tender.
- **Developing and including straightforward definitions and a glossary:** This could address the right terms to use for AI in commercial discussions (e.g. data versus IP rights, trained versus untrained models), as well as model contract examples.

- **Introducing ethical oversight into the procurement process:** A body composed of senior leaders should exist to provide ethical oversight of the applications of data. For example, in the UK the Office for National Statistics has an Ethics Board<sup>7</sup> that reviews and approves usage of data based on ethical principles.
- **Reshaping business cases to measure holistic benefits:** Traditional business cases make it difficult to justify spending money for pre-commercial activities and proof of concepts, and currently fail to sufficiently capture non-monetary gains.
- **Choosing the right opportunities for AI deployment:** AI is particularly adept at certain tasks and focusing on those will make it easier to reap the benefits faster. In the beginning of the AI deployment journey, departments and agencies should focus on the immediate opportunities and explore AI use cases that are very likely to succeed. For example, when it comes to case work it is easier to automate the simple cases, allowing case workers to spend more of their time on the more complex ones.

## Knowledge sharing

- **Setting up institutional processes to have a single point of contact or a repository of AI knowledge and information:** To be able to include the procurement within a strategy for AI adoption it would be helpful to have an overview of different AI-related government initiatives. Currently it is difficult to access this information and a team or organization such as the UK's Office for AI<sup>8</sup> could curate and share this information as well as provide coordination throughout government.

“ Define your post-deployment support needs and validate them with vendors.

- **Sharing best practices for AI procurement and deployment across government:** There is a need to share leading practices to ensure that teams can learn from the challenges and successes of other projects. For example, sharing best practice throughout government on agile procurement helps to show that it is possible to comply with procurement rules and regulations while at the same time accelerating the processes.

### Pre-market engagement

When conducting pre-market engagement, the issues that public officials need to consider and raise with suppliers include:

- Data requirements: What data do you need?
- Agile AI system development: Should we start with a proof of concept? At what cost could that be delivered? Should we consider outsourcing the scoping of the project to ensure that the challenge is well defined?
- Human in the loop: What is the strategy for keeping the human in the loop in AI deployment and how can AI-systems be integrated into process so that they work effectively with delivery teams?
- Public value and impact of the AI system: How can the public benefit and social value be demonstrated? What are the risks? How can an initial impact assessment be conducted in collaboration?
- Skills, culture and readiness: What skills are available in-house? Is the department ready to adopt the solution and integrate it with its processes? What are the internal challenges to the adoption of AI? Is the contract scalable? What training is required to effectively collaborate?

### Lifecycle management

Many of the lifecycle management issues discussed below are applicable for IT procurement in general. However, AI accentuates these issues, given an algorithm's constant state of change resulting from periodic updates to maintain its accuracy. The following were identified as important issues to address prior to any AI procurement project:

- Define your post-deployment support needs and validate them with vendors.
- Establish a holistic and long-term budget plan that includes maintenance costs, such as cloud storage, computing needs, the need for human-AI interaction, bias controls, model retraining and auditing.
- Avoid vendor lock in. Consider that you may want to shift services such as data management and hosting from one provider to another. Interoperability is critical to achieve this.

### Intellectual Property

- Be open to innovative risk and pricing agreements: The government and the private sector should have frank conversations about the risk level each can agree to take on for a given AI project, and the respective pricing to match.
- Establish best practice for ownership and usage rights of the AI solution: Ownership and usage rights should be considered and assigned to the party that is best placed to deliver the desired economic and social outcome.



## 4

# Ethics: Accountability, liability and transparency

“ An ethical, human-centric approach must be central to any AI deployment.

Ethical considerations need to be built into the end-to-end lifecycle processes of any technology solution and AI is no exception. This must be stated and ensured at procurement stage. AI developers and public-sector officials must understand the ethical considerations of AI solutions. A technology-centric focus that solely revolves around improving the capabilities of an intelligent system doesn't necessarily consider human needs. An ethical, human-centric approach must be central to any AI deployment.

A common criticism of certain AI applications is the opaqueness of data processing and decision-making. Transparency, interpretability and auditability are important considerations when using AI in the public sector. There are different ways of enabling transparency including: thorough documentation of the data, processes and algorithms, releasing the source code, or simple explanations of the logic of the system aimed at non-experts. In addition, when discussing transparency, it is important to distinguish between the transparency of the AI system and that of the wider organizational decision-making process, which includes the algorithm.

Challenges regarding AI transparency are particularly evident with advanced AI systems, such as deep neural networks. When deploying machine learning algorithms in public-sector organizations, particularly those that can have a significant impact on the lives of citizens (e.g. immigration, law enforcement) it is crucial to ensure that an acceptable level of transparency is designed into the system.

The discussions identified the following as key initiatives to move from theory to practice and apply the guidelines:

- **Establishing standards for the audit of AI systems and their underlying data:** It is necessary to consider what an audit should entail and what the minimum acceptable outcome should be.
- **Implementing performance measures and standards to evaluate performance against ethical requirements:** There is a need to find ways to measure performance against ethical principles so as to be able to make informed decisions about those tendering.
- **Acknowledging data ethics as a shared responsibility between public buyers and AI service suppliers:** There is a need to define, in broad terms, which responsibilities correspond to the government and which to vendors. This could be done at the macro level, for example, through a directive or on a case-by-case basis (e.g. each RFP could be used to define what the expectations are for that specific project). One way to achieve this is to define a set of enforceable standards on the safe storage and usage of data. Participants identified existing standards, such as UK's National Cyber Security Centre (NCSC) principles for cloud security<sup>9</sup>, which can serve as a model.

- **Articulating and demonstrating the public benefit of AI usage in tangible terms and developing an approach considering the proportionality of the application of AI:**  
It is crucial to make informed choices about AI deployment and consider ethical applications while balancing risk and public benefit. Citizens could also be involved in these choices through citizen juries or online panels. Deploy a framework for processes that explain how the AI model operates in practice as well as how to examine its decisions retrospectively.
- **Exploring the value of formal ethics panels:**  
These could be administered by an external and independent body that is empowered to question AI applications in the public sector. The ethics panel could monitor the AI systems and specific applications through life and have technical as well as ethical expertise.
- **Designing AI systems with a focus on how humans will interact with them:** For example, historic appeals data could be used together with upheld data to warn people when a decision is likely to be appealed. The system could highlight which details of the case would have to be changed for it to be approved. In this specific use case, controlling for bias plays a very important role as well.
- **Ensuring that there is a human in the loop for decision-making with direct impact to constituents:** A human should have oversight of a machine's decision making. There are two different scenarios. For relatively simple decision-making, a machine can help automate the process and a person can review after a statistically significant percentage of the outcomes. For complex decision-making, it is essential to have human review in place before any action is taken.
- **Focusing on iterative system development, user testing and good practice for assessment:** There is a need for user testing and formal trials (proportionate to the impact of the solution). Iterating prototypes with customer groups (government and civil society) on a regular basis is important for any digital service, but is even more important when it comes to AI deployment. The expectation that this approach be taken should be set early, during procurement.

# Roadmap for guidelines and AI adoption

Government departments and teams need to develop roadmaps and ensure that legislation enables the full implementation of the guidelines.

## Examples of initiatives that can be included in a roadmap:

- **Make the guidelines user-centric**
  - Adapting the language in the guidelines to reflect local public procurement vocabulary and provide a technical glossary for AI specific terms.
  - Tie the guidelines to the local procurement cycle to make them more intuitive. If possible, do this in a visual format.
- **Link the guidelines to real-world examples**
  - Link the guidelines to examples and case studies of AI procurement initiatives.
  - Consider the overlap between the different areas of action that are mentioned in the guidelines such as accountability and data governance.
  - Provide examples of innovative data applications within government and the value unlocked by these applications.
- **Provide additional guidance**
  - Highlight what is best practice for general IT procurement versus what's specifically important for AI.
- Highlight roles and responsibilities for procurement teams as opposed to a project manager and a delivery manager in an AI project.
- Develop standard terms and conditions for AI/ML projects.
- Provide sample templates for standard procedures and processes (e.g. request for proposal (RFP), invitation to tender (ITT), request for information (RFI)).
- Raise awareness and understanding of innovative procurement routes, such as innovation partnerships.
- **Disseminate knowledge throughout procurement teams**
  - Collect procurement teams' success stories and challenges related to the guidelines.
  - Appoint AI procurement champions to share knowledge.
  - Establish a community of practice for AI-interested procurement officials.
  - Provide references to training programmes for procurement officials.
  - Collect best practice on the flexible use of standard procurement procedures for different project phases of an agile delivery concept such as proof of concept, discovery, iterative delivery/testing and deployment.

# Workshops in the UK



Service demands are high and are unlikely to decline.

The Department for Transport partnered with the Office for AI to host the workshop. For the purpose of this pilot workshop a virtual multidisciplinary team of procurement officials, data scientists, digital delivery experts and policy and analytical experience was formed to provide feedback and develop an example case study for the potential application of AI in rail modelling. Participants from the Department for Transport were asked to work through the guidelines using a checklist before developing a fictional ITT to illustrate the application of the guidelines in a potentially real-world scenario. The example scenario was shared with all participants ahead of the workshop and provided the basis for the discussion.

A session with the Department for Transport was held on 4 October 2019 to gather feedback from a diverse set of stakeholders. The use of AI in public transport is a critical opportunity to unlock the value of data to improve the quality and efficiency for the public transport sector, especially in rail transport. AI is already playing a positive role in the rail industry. Analytic tools are helping customers plan and book journeys, and data is helping to provide more accurate real-time journey information. While developments in AI are exciting, there is still some way to go before its potential is unlocked and success depends on numerous elements working in harmony. In this specific case, the workshop focussed on the potential application for AI for transport modelling as an example of a procurement process.

A session with a focus on AI deployment in local government was held on 16 October 2019 and sought to gather feedback from a diverse set of stakeholders. AI tools promise to improve back office functions and deliver efficiency gains and services more effectively. Many councils appear wary of making the initial required investment when budgets are already strained and they lack resources to identify AI applications. Furthermore, they have concerns about ethical considerations. This is, however, slowly starting to change and there are several examples in the UK and abroad that show AI is considered not as hype, but as a genuine enabler of change. This sentiment is likely to increase once AI has successfully been implemented and the benefits are clear. Service demands are high and are unlikely to decline. This, combined with financial pressures, means that local councils and communities' might experience huge benefits through the smart use of technology, such as robotic process automation and AI in the future.

On 25 October 2019, the Forum organized a workshop in collaboration with the Defence Science and Innovation Laboratory (DSTL) and techUK to gather feedback from a diverse set of stakeholders. AI tools promise opportunities to improve back office services and deliver efficiency gains as well as to provide intelligence to address defence and

security-related challenges. The application of AI has already been investigated in the defence and security sector as the utilization of large amounts of data to support decision-making has been common for many years. A good example use case is the military readiness assessment, which is defined as the condition of the armed forces and their constituent units, formations and platforms (ships, planes etc). This was described by Deloitte as: "Large data volumes, diverse sources of information, complex interactions, and the need for speed and accuracy make military readiness a problem tailor-made for AI to tackle. And if AI can help tackle readiness, it can help the military tackle just about anything."<sup>10</sup>

DSTL's AI hub helps to improve the country's capabilities in the application of AI-related technologies. The laboratory conducts cutting edge research to support the UK's Ministry of Defence (MoD) with opportunities to help keep people safe from different future defence and security threats. DSTL has recently produced guidance on AI projects in the form of a [Biscuit Book](#).<sup>11</sup> Explaining the definitions and differences, latest thinking and developments, The Biscuit Book is something to be dipped into and easily digested – "just like a biscuit with tea". DSTL is at the heart of innovations in this area, working with other government departments, academia and institutions for the defence and security of the UK.

A session with the UK's Home Office's Accelerated Capability Environment was held on 14 October 2019 to gather feedback from a diverse set of stakeholders. The use of AI in policing, law enforcement and immigration has already been widely debated. AI tools promise opportunities to improve back office services as well as delivering services more effectively, but also particularly in these areas of application bring along many challenging ethical questions. While developments in AI are promising, society is still some way from unlocking its potential, and success in these areas depends crucially on ethical questions being answered fully. For example, the UK government has recently pledged to spend more money on the child abuse image database to trial aspects of AI including voice analysis and age estimation to see whether they would help track down child abusers. A paper by the security policy think tank Royal United Services Institute (RUSI) recently contributed to the debate over the use of machine learning algorithms. The paper that focused on predictive crime mapping and individual risk assessment, found algorithms that are trained on police data may replicate – and in some cases exacerbate – the existing biases inherent in the dataset, such as over- or under-policing of certain communities.<sup>12</sup> The Centre for Data Ethics and Innovation therefore also aims to develop a code of practice for the trialling of the predictive analytical technology in policing.<sup>13</sup>

Below: Centre for the Fourth Industrial  
Revolution United Arab Emirates

# Workshops in the United Arab Emirates



🗨️ **The key outcome from the session was a roadmap for adoption of the AI guidelines.**

Between 28-31 October, the Dubai Electricity and Water Authority (DEWA) joined the Centre for the Fourth Industrial Revolution and the Dubai Future Foundation to assess the applicability of the procurement guidelines in the Emirati public sector, focusing on DEWA, the first utility in the region to pilot the AI framework. Over the course of the four days the teams discussed the benefits and challenges of adopting the guidelines in DEWA. As part of the exercise, the Forum developed and reviewed an RFP for a chatbot application, which allows DEWA executives to quickly obtain answers to data-related questions. The application, which is a continuation of a customer-facing chatbot deployed by DEWA, highlights the benefits of using chatbots. The DEWA application allows users to retrieve information in considerably less time than if the user were to search manually, resulting in significant productive enhancements for users. The

workshop provided DEWA with insights into leading procurement practices for AI. In turn, the Centre for the Fourth Industrial Revolution team learned about the steps taken by the United Arab Emirates to lead in AI. Smart Dubai, a government agency tasked to improve the city experience for Dubai residents and visitors, is working on a government platform for data exchange throughout agencies. Still early in the process, data submission is for now voluntary and most data submitted is aggregated data. Dubai has also worked on AI tools for medical diagnosis with the Dubai Health Authority, as well as citizen-facing chatbots. These early steps demonstrate the type of initiatives governments around the world are considering as they begin their AI journey. The key outcome from the session was a roadmap for adoption of the AI guidelines. Participants agreed to prioritize the creation of a new procurement vehicle for AI and other disruptive technologies.



# Workshops in Bahrain



🗣️ **Vendors and government entities were invited to discuss the format of the RFP, as well as the tendering processes for AI solutions.**

From 5-7 November 2019, the Centre for the Fourth Industrial Revolution co-hosted, along with the Bahrain Economic Development Board and the Information and eGovernment Authority, a workshop in Manama to explore the applicability of the procurement guidelines in the kingdom's public sector. More than 70 participants attended the event, representing 25 different institutions from government, the private sector, academia and civil society. The participants helped the project team to identify potential high-value AI applications in Bahrain's public sector and test the value of applying the procurement guidelines. Reflecting actual business needs expressed by the Information

and eGovernment Authority, a fictional RFP was drafted for the purpose of simulating a potential target state of the procurement process of AI.

Vendors and government entities were invited to discuss the format of the RFP, as well as the tendering processes for AI solutions. The key outcome from the session was a roadmap for adoption of the AI guidelines. Participants agreed to prioritize the creation of a national data strategy, the development of a data sharing policy framework, providing an effective procurement process, upskilling government teams for AI work and creating an IP knowledge hub.



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private companies, governments, civil society organizations and academia to understand public-sector procurement of AI technology, identify challenges and define principles to guide responsible and ethical procurement. The opinions expressed herein may not correspond with the opinions of all members and organizations involved in the project.

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# Endnotes

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*Unlocking Public Sector AI*

# AI Procurement in a Box:

Pilot case studies from  
the United Kingdom

TOOLKIT  
JUNE 2020

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The UK government used the AI Procurement in a Box toolkit to design their own [guidance](#) for AI Procurement in government. In this document two teams are sharing their experiences of applying this guidance in practice.

1

# Department for Business, Energy & Industrial Strategy



# Overview

## What is the challenge that you are trying to solve with AI?

The Better Regulation Executive (BRE) aims to develop a regulatory system that is simpler for businesses to navigate, while maintaining important protections for citizens and the environment. The historical and incremental build-up of regulations can lead to disproportionate burdens on business, particularly if obligations are poorly co-ordinated. Digital innovations give policy-makers the opportunity, for the first time, to tackle this problem by looking at the UK's regulatory environment as a whole.

The BRE and the department for Business, Energy and Industrial Strategy (BEIS) sought technological solutions to help analyse the cumulative effect of different regulations on business. For example, it was looking for solutions that examine the complexity of regulations, how often they change and the interactions between them. Successful solutions could help the government prioritize future regulatory reform.

The BRE was mainly seeking technology solutions to the following problems:

- How can we analyse the stock of existing regulation and identify which requirements apply to different businesses and sectors?

- How can we assess how challenging individual regulatory requirements are for different businesses and sectors to comply with?
- How can we assess how challenging the cumulative stock of regulation is for different businesses and sectors to comply with?

From the outset, the BRE highlighted that from its experiences there are several things that make regulations more complicated and challenging for businesses to comply with. These include, for example, the length, complexity and scope of regulations, frequent changes to regulations, overlaps between different regulations and the different types and amount of regulation. The data for the project was available online as open data. The majority of the stock of UK regulation is stored at [www.legislation.gov.uk](http://www.legislation.gov.uk). It's free for anyone to use and republish and is updated regularly.

The government team welcomed different approaches to tackling this challenge and wanted to ensure that the solution is accessible and usable for a range of government policy-makers.

# Procurement process:

## Which vehicle or framework were you using? How long did you tender for?

The project is part of the GovTech Catalyst challenge fund. The Catalyst uses a £20 million fund to help solve public-sector problems (called “challenges”) using innovative digital technology.

The overall programme is delivered in two phases. A decision to proceed with phase two was made after the outcomes from the first phase were evaluated.

**Phase 1: Technical feasibility** – The first phase involved a feasibility study and research and development (R&D) contracts being awarded up to £50,000 (including value-added tax (VAT)). This is for

each project to demonstrate the technical feasibility of the proposed solution.

**Phase 2: Prototype development and evaluation** – The second phase involved up to two R&D contracts being awarded to businesses chosen from the successful first phase applicants. Up to £500,000 (including VAT) was allocated for each contract to develop a prototype and undertake testing for up to 12 months.

More information on the procurement process can be found [here](#).

## 1.1 Few government teams have procured AI solutions. What proved to be the opportunities and challenges?

We had the notion at the beginning of the project and before the start of the procurement that emerging technologies such as AI could help us to make sense of all the data we had. Nevertheless, we consciously did not provide details on what techniques to use in our invitation to tender.

Instead, we shared questions with the suppliers that needed answers and we shared the data that we had access to and thought could be useful in tackling the challenge. This way of working had a lot of benefits for us since the successful suppliers proposed a mix of different techniques and approaches, which we did not think of in the beginning and the project also evolved substantially over time.

From the start of the project, we saw two major opportunities. First, the opportunity to tackle a challenge that we weren't able to tackle previously and second, the opportunity to learn more about AI in government by delivering a project ourselves.

AI enabled us to answer a question that we previously weren't able to answer. The scale and the complexity of the question were too large to be addressed with traditional methods. It would have been too resource intensive and we are sure we would not have gained the same in-depth insights without using machine learning and natural language processing. The opportunity to use these novel techniques and methods allowed us to do something that no one has ever done before as well as come to conclusions that no one was able to reach previously.

The other opportunity was to experience a new way of working. Our team usually focusses on regulating new technologies as well as encouraging regulators to adopt new technologies to improve how they regulate. Therefore, developing an AI solution in partnership with industry allowed us to learn about

the pros and cons of AI adoption in the public sector. It also let us experience first-hand what it takes to overcome AI adoption challenges and how to make the most of the benefits of these new technologies.

Of course, there were challenges that we needed to overcome to deliver a successful AI procurement and project. The overriding question during the whole procurement process was how accurate will the AI-driven solution be at the end? There was a lot of excitement about the novelty of the approach and the potential to answer questions that nobody has answered before, but it was first and foremost key for us that the results of the AI model were helpful and future-proof. Therefore, the results needed to be accurate and interpretable. We focused on procuring an AI solution that added value to our overall processes and that we were able to integrate in our decision-making processes. We did not want to conduct an interesting data science experiment that did not lead to process optimization and that we could not use effectively.

Another challenge was the fact that the BRE, before the start of the project, had little technical expertise in-house. To make effective decisions during the procurement process we partnered with BEIS Digital and the experts at the National Archives. As a result, what at the start seemed to be a challenge actually became an opportunity. We were able to expand our network throughout government, got the right experts on board and reached out to cross-government networks to ask questions and share our lessons learned. We found that there is really a need for multidisciplinary teams in AI procurement. Breaking down organizational silos not only allows you to tap into the knowledge needed to be successful, but also raises awareness of what you are doing and what you are learning throughout your organization.

## 1.2 Why were you keen to use the guidelines for AI Procurement?

Adoption of AI-driven tools was new for us as a team, but also for the government as a whole. There is the need for skills and expertise to get AI-driven projects right, in particular the procurement of these projects. When we found out about the guidelines, we thought that it is great to have a central repository that provided a guide to what to think about during the different phases of the procurement process. We were

in need of guidance on best-practices and ideas and therefore the guidelines were a useful tool for us.

The framework of the guidelines gave us the structure needed to check our understanding of the requirements, develop a plan for our procurement and the project more widely and cross-check our approach. Most importantly, the guidelines helped us

when writing the invitation to tender and preparing the interviews with suppliers.

The two aspects that we found particularly helpful and that changed the way we were thinking about the procurement were:

1. Explainable AI – Ways and methods to ensure that the results of the AI-driven system are interpretable
2. Audits – The use of third-party audits that we did not consider previously

### 1.3 How did you go about consulting the guidelines?

We used the checklist to help us structure our approach. We shortlisted the key questions in the guidelines that were particularly important to our project. We did this while drafting the request for proposal (RFP), which helped us to add relevant questions and requirements right away. The guidelines helped us not only to clarify our approach, but also gave us specific ideas about what to prioritize and what further expertise we needed in our team.

The guidelines gave us the confidence and the skills that we needed to run the process and confidently engage with suppliers.

We also got feedback from the suppliers who responded to the RFP; those that consulted the guidelines found them helpful, providing a better understanding of our procurement approach and why we were asking the questions that we did.

Generally, the guidelines were most helpful right at the start of the procurement. It helped most at the planning and preparing stage since they provide an overview of issues that might come up and that users should be aware of. We “skilled up” our team during the process and got experts to join to help shape and guide the process.

### 1.4 What made it easier for you to implement the guidelines?

Usability of the guidance and accessibility of the concepts and processes discussed are important. It was helpful that the guidelines outlined the procurement process that you need to go through and provided guidance at each step. The checklist helped with preparations at the beginning and was useful to refer to at every stage of the procurement process. It is also important to include in any type of guidance not only what issues to consider, but also why this is important along with ideas on how to address them during your process.

It is important to use plain English because most of our team using the guidelines did not have much

experience with data science and AI techniques, and were learning along the way. In the future, case studies like this one and examples of use cases will make the guidelines even more accessible for a broad audience.

In a project like ours we learned that if the scope of the project is quite broad and you are working with a lot of unstructured data, it is really important to build in assurance processes and mitigation strategies, such as focusing on explainable AI and using third-party audits.

### 1.5 You used a challenge-based procurement process. Do you have any insights that you'd like to share?

The challenge-based procurement process is useful for projects with a high level of innovation. For us, the approach was helpful because it gave us a lot of flexibility in the procurement process. It allowed us to trial different approaches, conduct a feasibility

study and learn what works for us. It ensured that we scoped out the project extensively and encouraged us to challenge our previous assumptions at different points of time, all of which led to an excellent AI-driven solution that we can use in government.

## 1.6 Best practice

Take a very agile, user-centred approach to AI procurement. In traditional procurement processes you are sometimes prone to almost design a solution before you go out to tender. As such, it is important to keep questions in an RFP at a high level, the requirements not too onerous and to continue to have an open mind about what responses you might receive even if you started out with an AI project in mind.

Don't underestimate the benefits of working in a multidisciplinary team during an AI procurement. Consider bringing in the right skills as and when you need them and plan in advance so your processes are not slowed down because of resource constraints. Contact experts in the field and make use of cross-government networks to gather insights and share experiences.

Be aware of the potential risks of your project and actively mitigate them through your approach. One of the challenges in our project was the vast amounts of unstructured data that we worked with. We needed to adapt the data source, restructure and enrich that data with other data sources while at the same time ensuring that the AI model results are interpretable.

Make the guidelines your tool and ensure that you use them for the relevant parts of your project. Not everything in the guidelines will necessarily be relevant to your AI project. It is important to acknowledge this and focus on the areas that are of greatest relevance to you. Ethics are an important consideration for our project, but we focused more on aspects of "explainability" and transparency rather than bias concerning individuals because we are not using sensitive data.

Use the guidelines iteratively and return to them during different phases of the procurement process, using them as a way to challenge your assumptions and test your approach.

There is not much else out there on the procurement of AI-driven solutions in terms of best practices or lessons. If you would have to do this without any resources this could be a pretty daunting process. The more you can make use of the guidelines during your procurement process, the better. Using the guidelines definitely helped us and improved our approach and we strongly encourage teams across the UK Government, but also globally to use the guidelines.

### BOX 1 The supplier's view

All participating potential suppliers had already heard about the UK's data ethics framework before the procurement process.

Most suppliers found it important that they were asked to describe how their approach to AI development and deployment met government digital service and ethics standards. They supported the suggestion to include ethical considerations in the proposal evaluation.

Some of the suppliers highlighted that questions considering ethical standards can be quite vague and general. "There are many different standards and their requirements are also a bit overlapping, and not every standard is as relevant to this specific project." Therefore, suppliers suggested including questions only related to the most relevant

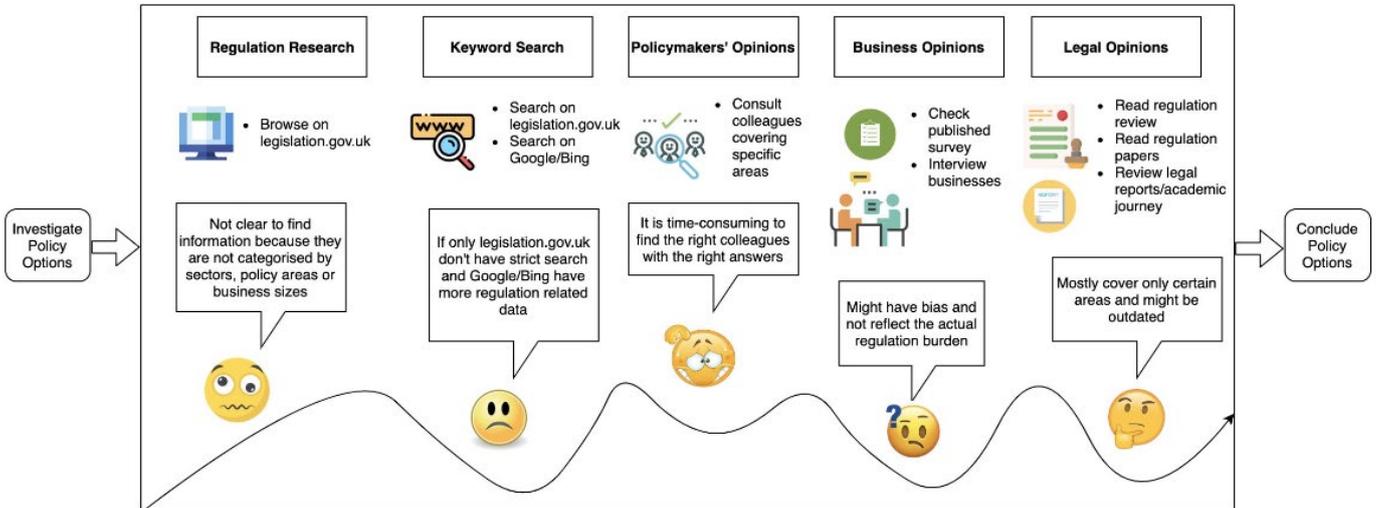
standard or more specific questions on how certain standards will be met during the AI development.

All suppliers stated that they would agree to a third-part audit of the AI system that they developed. All suppliers agreed that it is important to ensure trust in the AI-driven solution.

"Given the need to build user and public understanding and confidence in AI solutions, as well as to detect and address emerging issues with the use of the technology, an audit requirement could be a useful measure. But the detail would matter – the specification, who the auditors were, whether they (and the audit protocols) could cope with the variety of applications and technologies in use, such that it would be a meaningful process that did add value."

FIGURE 1 | User journey maps from a supplier's perspective  
Presentation by Qualimental Technologies

## User Journey Map - As Is



## User Journey Map - To Be

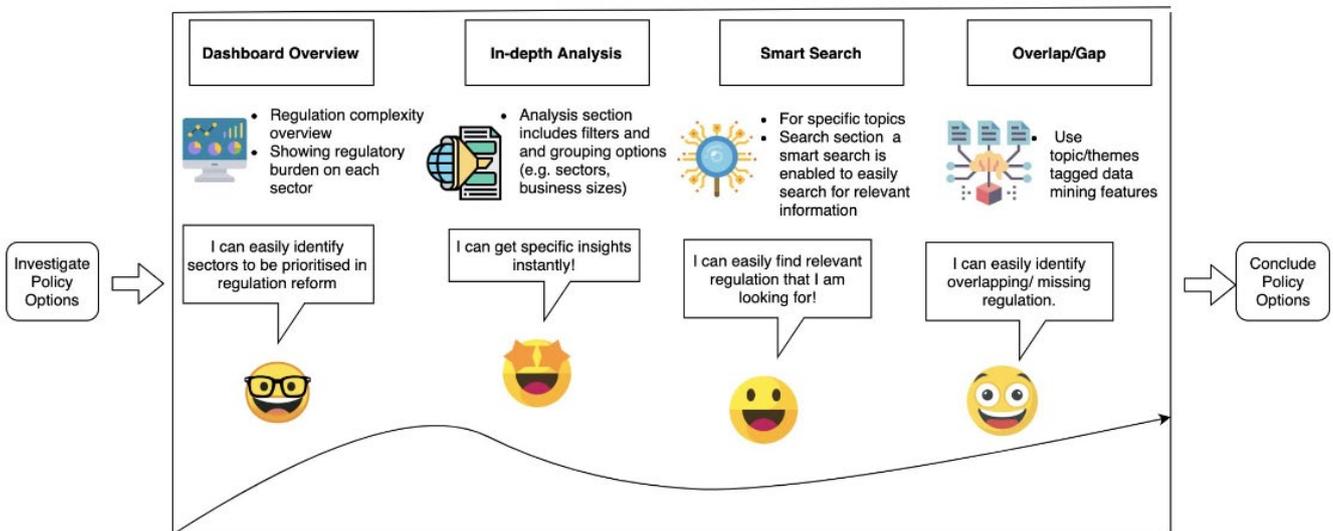


FIGURE 2 | **Explainable AI was a priority**  
 Presentation by Qualimental Technologies

## Explainability

### User Interface

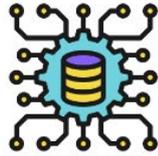


Info Icon on front-end application to show more information

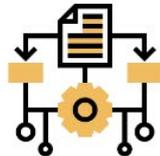


Channels for users to challenge the AI results and provide feedback

### Explainable AI

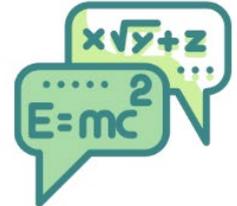


Explain training datasets used & Nature of the data available in the training database



Explain type and structure of the model, the processing algorithms and extracted features

### Statistical Model Explanation



Specify the formula, variables, factors and explain function nature in simple technical language

2

# Food Standards Agency



# Overview

The United Kingdom's Food Standards Agency (FSA)'s aim is to be able to protect consumers now and in the future. Therefore, it is important for the organization to forecast potential risks and take action in a timely manner. As the competent authority in charge of regulating the food and feed sector in the UK, the FSA needs to be aware of risks affecting UK consumers related to safety and authenticity in the sectors. Over the last two years, the agency has extended its use of emerging technologies to identify risks.

The focus on the project that the agency most recently procured was to develop further predictive capability within the agency to mitigate against food and feed safety risks. The FSA wants to develop an overarching artificial intelligence (AI)-based system that while remaining agile and decentralized, enables additional data and intelligence sharing, the re-use of technical solutions throughout government and clearly ties into actions taken by the remainder of the FSA.

## 2.1 Few government teams have procured AI solutions. What proved to be the opportunities and challenges?

The FSA expects many benefits from using AI applications. AI techniques enable us to build more complex models, allow us to make better predictions and help us to better identify risks. The use of AI systems enables us to more effectively allocate resources and as a result, saves the organization costs. We have also found that we were able to reuse our AI toolbox in other use cases and share the findings as well as the tools themselves with other organizations, such as local authorities.

Traditional approaches like statistics are very powerful, but have their limits. AI-based applications are well placed to consolidate large amounts of information that are stored in multiple data sets throughout the world, to analyse this information, identify patterns and to provide us with actionable insights. AI-driven systems allow us to gather insights in minutes that otherwise would take hours, days and probably in some cases, months to compile.

For example, analysts in the FSA have been using AI-based models and real-time weather data to predict toxin contamination produced by mould, which can be prevalent in food commodities like fruits and nuts. There is a very clear correlation between the weather conditions during harvest and storage of those commodities and the levels of toxins at the point of consumption by people. This smart and data-driven approach allowed us to target inspections and controls. We used those trained models and also applied them in similar use cases.

Access to standardized data and data quality are key challenges for AI adoption for the FSA as well as the whole public sector. Currently, data is essential for any AI project. Exploring the potential of data trusts to share data and intelligence throughout organizations, which the Office for AI has done in the UK is a good start, but needs broader collaboration throughout government and industry.

The UK has also advanced significantly with regard to the open data agenda in recent years, but even when the data is open and readily accessible, there are still challenges when you operate with different data sets that aren't standardized. There is much more that the government could and should be doing to make data sets accessible and usable. For example, when it comes to the quality of the data and the interoperability of different data sets. A government-wide open data catalogue or a data dictionary with all relevant information including data quality would be a tool that could boost AI and analytics uptake considerably.

Another challenge for AI adoption in the public sector is the concern around ethical considerations. In particular, how to operationalize ethical principles, how to practically apply guidance and how to best implement "explainable AI" (meaning AI systems that allow us to interpret the outcomes of the algorithms). There is currently little centralized support in the UK public sector and every team has to develop an approach from scratch that works for them, which in turn, creates inefficiencies as well as uncertainties. So, the FSA is trying to proactively address this gap by facilitating conversations throughout government about AI ethics and linking up with institutions such as the Centre for Data Ethics and Innovation.

Last, but not least, in-house capabilities and skills are a key challenge, but also opportunity.

To raise awareness and build expertise the FSA started with identifying proof of concepts that really show the value of AI to decision-makers. The agency also focused on business engagement and partnered with experts in the field on proof of concepts and pilots. Since their first AI-driven projects the agency has also been successful in recruiting and upskilling their teams.

## 2.2 Why were you keen to use the guidelines for AI Procurement?

We were proactively looking to support our AI procurement efforts with specialist knowledge and best-practice throughout government departments. We found it challenging to find examples of best-practice for AI procurement within government departments. There are more experienced delivery teams in various departments, but there is not yet a centralized approach to sharing knowledge. We found that the AI Procurement Guidelines were a good repository of key considerations and they helped us to structure our approach to the procurement of the new AI-based system effectively. It was easy to see what considerations

to focus on and the guidelines served as a basis for discussion as to how this related to our project.

Not all of the issues mentioned in the guidelines were relevant to our project, but having an overview of all possible considerations and ideas on how to best learn from others who have done similar in the past was very helpful. What we found particularly useful were the insights on how to encode legislation and standards into our work. It also helped us think about public benefits and potential impacts of our work beyond the immediate business need.

## 2.3 How did you go about consulting the guidelines?

The guidelines were particularly useful at the specifications stage and helped us ensure that we are going to a market with a clear problem statement asking for the right things. The guidelines built on the [Tech Code of Practice](#), which we are already using to design, build and buy technology. This made it easy to integrate them in our processes. We used the guidelines to include signposting for ethical requirements, technical feasibility and capability building in our

invitation to tender. The guidelines worked for us as a checklist to ensure that we addressed the important issues that are peculiar for AI procurement and our project.

We found working with the guidelines effective. After we issued our invitation to tender, we received fewer supplier questions and more responses to our invitation to tender than the previous time we procured for AI capabilities.

## 2.4 How did you go about the procurement process?

We found the Digital Outcomes and Skills (DOS) framework fit for purpose for our procurement approach. The framework enables a flexible approach to IT procurement since it is set out to highlight the challenge that you want to address rather than focus on one specific technology. This framework often helps the public sector buy, design, build and deliver digital outcomes by finding appropriate specialists to deliver agile software development. The DOS framework is also often used for the procurement of digital teams or individual contributors, to work alongside in-house

delivery teams. This procurement approach aligns with the principles set out in the AI procurement guidelines since it asks for a focus on the challenge rather than the specific solution.

A key aspect of our procurement is that we tendered for a call-off contract allowing work packages to be agreed and awarded throughout the term of the agreement. This supports the agile delivery of the projects and provides us with the flexibility to react to new findings and mitigate risks with delivery timescales and project alterations.

## BOX 2 | The supplier's view

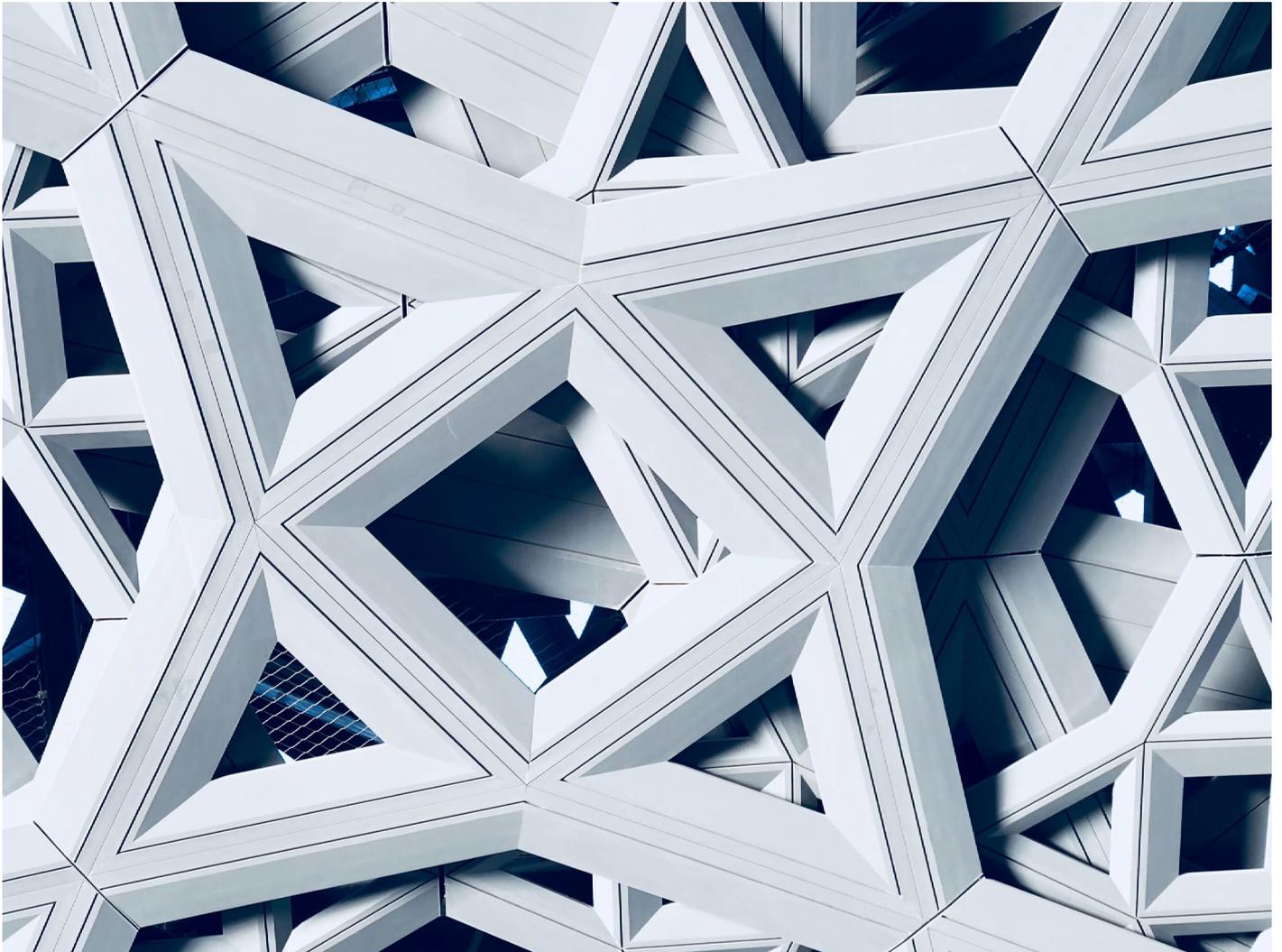
The suppliers highlighted that for someone new to this domain the UK AI procurement guidelines are a helpful and a good summary of UK Government procurement for AI.

Feedback included the importance of terms and references for non-technical staff in AI procurement teams in government as well as from the suppliers' perspective. "For non-technical experts who work in AI (e.g. procurement experts, business change consultants, leadership, Scrum Masters) it would be useful to have a short intro saying what AI is, what it isn't and how it relates to other terms such as statistics, economics, data science and machine learning. All of these definitions will be according to a UK Government definition as few of them (especially AI) have singular, agreed definitions."

Explaining why ethical considerations are key for AI procurement is also important. One supplier explained that, for example, "creating traditional predictive models involves coding a series of instructions that allows the predictive engine to appear to make decisions (like a human) based upon source data. The supplier further explains how the AI approach differs from the traditional approach: "Coding instructions is incredibly labour intensive

and as such forces the creator (developer) to think deeply about every instruction and the implications of including or excluding it. Machine learning uses algorithms that enable the machine to write these instructions automatically based purely upon source data. This saves time, but also removes a lot of "thinking time" from the predictive model creation. As such, it's easy for a machine learning algorithm to pick up biases in the data and codify them as instructions and it's hard for the creator to then spot these biases. Hence, properly executed AI projects must add this 'thinking time' back in."

Furthermore, feedback shows that more needs to be done in the future to ensure that it is easier to prove compliance with ethical frameworks in government. The communications from the government need to be clearer on the specific expectations for suppliers. Feedback was that often suppliers have ethical considerations embedded into their ongoing processes and it is difficult for them to provide evidence for standalone tasks because they see this as merely good practice. In their view this does not mean that they are not operating ethically, but that they are ethical by design and that those considerations are ingrained in everything that they do.



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private companies, governments, civil society organizations and academia to understand public-sector procurement of AI technology, identify challenges and define principles to guide responsible and ethical procurement. The opinions expressed herein may not correspond with the opinions of all members and organizations involved in the project.

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