An Applied Research Agenda for Data Governance for AI

The GPAI Data Governance Working Group

July 2021

This report was developed by experts of the Global Partnership on Artificial Intelligence's Working Group on Data Governance, with the support of Ed Teather. The report reflects the personal opinions of GPAI experts and does not necessarily reflect the views of the experts' organizations, GPAI, the OECD or their respective members.

Co-Chairs' Foreword

Dr. Jeni Tennison
Vice-President and Chief Strategy Adviser
Open Data Institute

Dr. Maja Bogataj Jančič
Founder and Head
Intellectual Property Institute

We are delighted to share this Applied Research Agenda for Data Governance. It is the product of a few months of reflection and work by the Global Partnership for AI (GPAI) Data Governance Working Group in Spring 2021, during which we developed ideas for projects and programmes of work that could advance GPAI's mission, and could be implemented by GPAI's members and in partnership with others.

To give shape to these ideas, we created a number of concept notes, framing challenges around data governance for AI, and the applied research activities that could address those challenges, as a way of getting to the action and kinds of impact that we want to see GPAI achieve.

From an initial longlist of nearly 30 ideas, we developed seven detailed concept notes. We were delighted that other GPAI Working Groups adopted a similar approach for developing and articulating ideas for projects, and worked with the GPAI Steering Committee to prioritise our ideas in line with their steer for practical projects that could demonstrate near-term progress and have the potential to be built upon in future years.

Prioritisation is hard, but we are extremely fortunate to have a very collaborative, team-spirited Working Group. We combined elements from across the concept notes to develop two cross-domain projects that we are very excited to be taking forward over the next 18 months: "Advancing research and practice on data justice" and "Enabling data sharing for social benefit through data trusts". You can find out more about these on the GPAI website[1], and we will be looking for partners to help further develop and pilot that work in 2022.

Inevitably though, the necessity to focus our efforts means we think that there are many great ideas in the concept notes we developed within the Working Group that we are not able to take forward this year.

[1] https://gpai.ai/projects/

That is why we want to share them with you. We want to celebrate the insight and imagination of our Working Group experts, and would love to hear your feedback on their ideas. We want to know what stimulates your own thinking, what chimes with your own priorities, and what ideas they may trigger of your own.

Your feedback on these ideas as they currently stand will help shape the Working Group's thinking as it develops a pipeline of projects that GPAI's members and the wider AI community can get behind.

We hope you enjoy them, and we give deep thanks to the Working Group members who have brought so much creativity, insight and meaning to GPAI's mission.

If you would like to get in touch about the Data Governance Working Group's future work, then you can reach us via GPAI's Montreal Centre of Expertise, the CEIMIA, on info@ceimia.org, or tweet us at @JeniT and @majamajab.

CONTENTS

1. Summary of concept notes

1. Enabling data sharing for social benefit through data institutions

The gap that data trusts and other innovative institutional approaches could fill in enabling trustworthy data sharing is commonly recognised, but it is still not yet clear how they should be created or managed.

This proposal would seek to address that challenge with a programme organised into three workstrands: (1) foundational issues (to generate insights that can inform guidance or best practice in the creation of data trusts), (2) legislative frameworks (that support the development of an ecosystem of trustworthy intermediaries), and (3) data trusts for the SDGs (identify and support pilot projects where data trust could accelerate progress).

2. Guidelines on the documentation of datasets and data management

The Role of Data in AI report, commissioned by the Data Governance Working Group, included a recommendation that GPAI should "work to shape best practices and standards for data governance with the aim to drive access to good quality data for AI projects and systems".

There is some existing work in this space (e.g., Microsoft's Datasheets for Datasets among others) that many less mature organisations could benefit from. There are also compelling examples of significant data collection gaps in the areas of sex disaggregation and race data collection in, for example, mortgage and loan approval and underwriting, workforce safety, health care, and medical treatment domains.

The project would therefore provide a 'state of the nation' review of efforts in this space, consulting with those in industry already leading, and provide recommendations in the form of guidelines on best practices for the documentation of datasets for use in AI system development and deployment. The guidelines would act as a "checklist" for busy professionals leading the deployment projects that either use or generate data resources, their managers, and their executive managers.

3. Creating global rules for copyright exception for text and data mining (TDM)

In order to achieve AI development and to train AI algorithms, a large amount of data (big data) is required. The information (data) embedded in a given work or piece of content (e.g. a scientific article) is not "owned" by the copyright holders, yet copyright can create impediments to access and use that information in a digital context.

Text and Data Mining ("TDM") exceptions and limitations have been designed to bridge the gap caused by different legal jurisdictions with respect to research. For an inclusive development and economic growth it is important that exceptions and limitations are globally harmonised. This project would aim to: map the

adoption of TDM internationally, assess the benefits and risks of difference among jurisdictions, and identify the appropriate (international) legal instruments and organisations that would be most efficient to achieve a harmonised approach.

4. Squaring the circle of achieving an innovation-friendly climate and a high level of protection in data privacy law

This project would compare different approaches taken in different parts of the world to this challenge, with their actual effects for protection of the individual and for innovation critically assessed, in order to come up with a toolkit and recommendations for action.

The project would provide a clear conceptual definition to this goal, and test public attitudes on how it should be met. It would develop an analytical framework for understanding innovation vs. privacy trade-offs, identify the elements that an innovation-friendly climate requires, and a toolbox of legal instruments and technical instruments for developers to help them navigate this challenge.

5. Formulating transnational legal principles governing rights in co-generated data and third-party data

This project would focus on data rights within the context of AI with regard to two contexts: (1) 'co-generated' data (for which principles have been designed to recognise many different players have contributed to the generation of data in many different ways), and (2) third-party data (where data rights are vested in parties that do not contribute, for example access to public sector data for commercial re-use).

This project would review how these concepts have been developed to date by existing initiatives, ascertain how far those initiatives address an AI-specific context, and what further protections (legal, technical and institutional) may therefore be required.

As part of this project, collective data rights would be explored - and whether, and under what conditions, they should exist. As was noted in the Working Group's Framework Paper, there is a question as to whether rights in co-generated data should be vested not only in individuals but also in groups of individuals, such as defined by language (e.g for speech data), ethnic origin (e.g for genetic data), or activities (e.g data from connected vehicles).

6. Supporting the development and adoption of trustworthy privacy-enhancing technologies

Training AI algorithms requires data, the more data the better, and these data can come from multiple organisations, spanning multiple countries. A range of inter-connected technologies - e.g., differential privacy, federated or secret computing, homomorphic encryption - could potentially help address issues of privacy, sovereignty, and IP protection that arise when contemplating this type of data access and use. However, it is unclear if and how these technologies, in their current state, can be effectively deployed in operational settings to achieve those objectives.

This project would have three aims: (1) assess the current maturity and impact (to date) of technology

solutions; (2) identify barriers to further development and adoption; and (3) propose initiatives - e.g. research, building of standards, incentives for adoption, supporting changes to legal and policy frameworks - that can help overcome these barriers.

7. Data Justice for Beneficial AI - Privacy dimensions

For the purposes of focusing the vast area of data and development in relation to AI, this project will adopt a data justice lens through which to look at three areas of inequity and injustice in relation to three proposed research streams - access, datasets and algorithms governance. The research will seek to identify the necessary points of policy intervention or governance in these three interlinked focus areas and the institutional arrangements and measure in resource constrained conditions in order to enable more even, equitable and just outcomes in relation to AI. The research is premised on the understanding that governance that does not actively redress the uneven outcomes of current processes of digitalisation and datafication will perpetuate the status quo and the dominant interests, power relations and on the recognition of the differential impact of AI on people, communities and countries in terms of harms and as a result the different kinds of risk mitigation for different people, communities and countries.

2. Enabling data sharing for social benefit through data institutions

This concept note was led by Neil Lawrence and Seongtak Oh, with contributors including Jess Montgomery, YeJee Park, Kim McGrail, Alison Gillwald, Jeni Tennison, Bertrand Monthubert, Alejandro Pisanty Baruch, Christiane Wendehorst, Michael Dose, Josef Drexl, and Nicolas Miailhe.

The concept note has been carried forward in the Working Group's project, "Enabling data sharing for social benefit through data trusts".

2.1 A description of the challenge that needs to be solved and background on what's known so far

Effective data stewardship is essential for a variety of public policy goals and for realising the wider economic value of data. Recent years have brought numerous examples of the potential benefits from innovative uses of data, and examples are emerging of areas in which communities are seeking to take the reins of their data – promoting its use for certain purposes. At the same time, evidence of the harms associated with poor data governance practices is mounting, across sectors from recruitment to criminal justice, leading to calls for new data institutions that provide careful stewardship of data, through independent oversight and mechanisms for accountability.

New forms of collaborative data stewardship are emerging; data trusts are a promising tool to empower individuals and communities. A data trust is a data institution in which individuals pool their data or data rights, creating an independent organisation that is tasked with stewarding the data rights it holds for the benefit of its members, based on strong institutional safeguards and the fiduciary responsibilities of those overseeing the trust, with the aim of enabling collective action to enable better terms and conditions of data use. Data trusts are a form of data institution whose core characteristics include: independent stewardship of data rights, collectivisation and collective action, and institutional safeguards to manage the vulnerabilities associated with data use. While the exact form of data trust might vary in different jurisdictions, these characteristics distinguish data trusts from standard contractual or cooperative models of data governance. Data trusts fill a gap in the current data governance landscape by empowering individuals to exercise their data rights; supporting individuals and communities to share data for social benefit; and providing stewardship that anticipates the vulnerabilities resulting from data (mis)use and takes action to prevent these digital harms emerging. Governments across the world have centred data trusts in their national data and AI strategies, in the hope of achieving these goals, and data trust-like projects are emerging across a range of jurisdictions.

Important challenges must be addressed to establish data trusts. Firstly, there is a pressing need to create consensus around the core features of a data trust, which – as a starting point – this project takes to be: independent stewardship, strong institutional safeguards, and bottom-up collective action. Secondly, given the global nature of the digital economy, it seems likely that these core features would be best established through different legal frameworks in different jurisdictions; if data trusts are to operate safely and effectively within different countries – or across borders – better understandings of the jurisdictional issues associated with their establishment will be necessary alongside better sharing of information about lessons learned from projects across the world. Thirdly, there is a range of operational considerations that must be taken into account in the implementation of data trusts – the nature of the data rights being managed, long-term financial sustainability, technical architectures, and mechanisms for accountability, for example – and further work is needed to characterise these ways of working. There are also opportunities to consolidate learning from recent efforts to

understand the nature of public interests and concerns about data use, and to apply these lessons to the development of data trusts.

Data trusts could serve a wide variety of different audiences and purposes. Individuals might value the increased agency in decisions over data use that data trusts offer, or the ability to promote data use for altruistic purposes; communities – whether local communities, groups with a shared interest, or a range of different businesses, NGOs or universities – could use data trusts to pursue their interests; in areas where there exist few or no data rights, individuals might seek to establish data institutions to fill this gap. Different models will be more (or less) suited to operationalising data trusts in different areas and there are opportunities for all countries to learn from the different approaches being taken across the world. The process of creating data trusts also seems likely to expose the limitations of current data governance frameworks, identifying areas where action is needed from policymakers; this might include creating new legal principles, for example in rights arising from cogenerated data, or adapting current policies to allow innovation in data governance while providing appropriate safeguards.

GPAI's ability to convene across countries and disciplines could help address these challenges by sharing best practice, identifying ways or working, and supporting bottom-up pilots in areas of need. Creating the conditions in which all in society can participate in and benefit from the work of data trusts requires further work to: clarify their core components; engage with communities that could benefit from data trusts to support further piloting and innovation; design ways of working and best practices that should inform their operation; and to create an enabling policy and investment environment. By building consensus and shared understandings around the fundamentals of data trusts, GPAI can lay the foundations for an ambitious research agenda and practical action to create data trusts in areas of need. This project will work to identify current practice in developing data trusts from across the world; better understand the incentives and ways of working that can make data trusts – or data institutions that fulfil equivalent functions – accessible to all in society; and support pilot projects that trial data trusts methods in practice.

2.2 A definition of the project in terms of what we need to know (cutting edge research) or create (an applied AI project)

This project's vision – of an ecosystem of data trusts in which individuals and groups are empowered to influence how data about them is used – requires that:

- *There is a demand for data trusts from those individuals or groups that could benefit from their use.* Such demand would be enabled by clarity around the benefits that data trusts can bring and by engagement activities to ensure that those communities in areas of opportunity or need are actively involved in the development of data trusts that serve their needs.

- *All can access research and insights to help design and implement a data trust in their home jurisdiction*. A research agenda on data trusts would cover issues such as: the value proposition underpinning data trusts, the business models that can ensure their sustainability, the skills needed to govern a trust, and the interventions needed to ensure data trusts are accessible to all.

- *The community identifies what technical systems might be necessary to deliver data trusts develops technology architectures that can support trustworthy data institutions.* Such architectures include systems or services that enable safe and trustworthy data collection, storage, sharing, use and re-use.

- *The policy environment provides a framework for the development of data trusts*. Such policy frameworks would reflect the needs of different jurisdictions, supporting innovation while providing appropriate safeguards against failure or abuse and mechanisms for accountability.
- It may include the development of legislative frameworks to govern data intermediaries such as data trusts.
- *There is sufficient 'proof of concept' that data trusts work in practice* to encourage others to engage in the creation and governance of data trusts.
- *Decision-makers can understand the value of data trusts,* and policymakers are able to design appropriate governance frameworks.

To create these conditions researchers, policymakers, civil society, and industry require better understandings of:

- how data trust approaches are being trialled in different communities and jurisdictions, and the lessons emerging from these;
- how different legal traditions could create frameworks to underpin data trusts and where there are gaps in these frameworks;
- the key features of data trusts and the action needed to establish data institutions that fulfil these functions in practice;
- the incentives that can promote – or undermine – engagement of different stakeholders with data trusts, and how to balance competing individual and collective interests and public perspectives on these issues;
- how data trusts can be made financially sustainable over the long-term;
- what technical infrastructures might be required to underpin the operations of data trusts;
- the potential failure modes associated with data trusts;
- what policy or legislative frameworks are required to establish an ecosystem of data trusts.

Each of these areas could form the basis of a programme of research and engagement to generate insights and identify best practices.

In moving to the creation of real-world pilot studies, those creating data trusts will further require:

- Evidence of the value that data trusts can provide;
- Development of technological architectures and tools that might be necessary to underpin the operation of data institutions;
- Platforms to connect with others developing data trusts and share best practice;
- Guidance on how to set up data trusts in practice.

2.3 An outline of the intended impact of the project long term and outcomes expected by the end of the project

The Data Trusts project will support the creation of real-world data trusts that enable data sharing for social benefit. In so doing, it will provide new institutions that empower individuals and communities to enact their

data rights, ensuring that data sharing activities reflect the diverse interests of all in society.

In pursuit of this goal, the project will help build the foundations for pilot studies and generate toolkits that demonstrate the value of data trusts and how they can operate in practice, creating the conditions in which others in society are able to set up a data trust to meet their needs.

2.4 A definition of the more specific outputs, activities and success measures for the project

The outputs are focused on foundational research that will enable the practical action to create data trusts in areas of need (pilots are proposed under partnerships in the next section):

Workstrand 1: Creating consensus and identifying best practice (Share lessons learned so far and generate insights that can inform guidance about the creation of data trusts)

This workstrand would advance understandings of core concepts and current practice through:

- Cross-community engagement that identifies how projects across the world are creating data trusts, highlighting the different ways in which those projects are responding to community need while demonstrating core data trust characteristics. This could produce consensus statements on the core attributes of a data trust; databases of current projects and how they address each of these core attributes; and papers on lessons learned from different ways of working.
- Where needed, research to further identify best practice in operationalising data trusts (for example: underpinning technical systems, forms of value creation, mechanisms for inclusion and participation, business models, interaction with rights in different jurisdictions, value of data trusts)

Short-term deliverables from this workstrand could include:

- A GPAI consensus statement on tenets of a data trust, setting out the role of these data institutions and the principles or core attributes that inform their ways of working.
- An initial survey of existing data institutions, exploring how different efforts have implemented core features of a data trust.

Workstrand 2: Legislative frameworks (Design legislative frameworks that support the development of an ecosystem of trustworthy intermediaries)

This workstrand would identify policy or legislative interventions to enable trustworthy data trusts, by:

- Reviewing existing frameworks, identifying best practice or lessons that can be transferred between jurisdictions about how different legislative environments support (or do not support) the creation of trustworthy data intermediaries;
- Considering how data trusts can be established in different jurisdictions;
- Designing a legislative framework to govern the operation of data trusts (or other related data intermediaries).

Short-term deliverables from this workstrand could include:

- A scoping review of current legal frameworks for the development of data trusts across jurisdictions, identifying areas of uncertainty (for example, rights relating to co-generated data) or need (for example, structures for accountability or safeguarding in the event of institutional failure).

Workstrand 3: Data trusts for the SDGs (Identify areas where data trusts could accelerate progress to achieving the SDGs and support pilot projects in these areas)

This longer-term workstrand would engage with communities in areas of opportunity to establish data trusts, working with those communities to help co-design a data trust to serve their needs.

3. Guidelines on the documentation of datasets and data management

This concept note was led by Dewey Murdick and Takashi Kai, with contributors including Shameek Kundu, Hiroshi Mano, and Jaco Du Toit.

The concept note was combined with the data justice concept note to develop the Working Group's project, "Advancing research and practice in Data Justice".

3.1 A description of the challenge that needs to be solved and background on what's known so far

The Role of Data in AI report included a recommendation that GPAI should "work to shape best practices and standards for data governance with the aim to drive access to good quality data for AI projects and systems." There is existing work in this space (e.g., Datasheets for Datasets, Model Cards, Data Nutrition Project, Data Statements, among others) that many less mature organisations could benefit from. There are compelling examples of bias and significant data collection gaps in the areas of sex disaggregation and race data collection in, for example, mortgage and loan approval and underwriting, workforce safety, health care, and medical treatment domains that will directly impact AI system performance. Additional challenges include a lack of data availability, discoverability, reproducibility, and the absence of useful benchmarks that provide a sound evaluation baseline when deciding which models to utilize in an operational setting (see, for example, linguistic diversity report by UNESCO, which highlights the urgent need for data collection in light of the need for linguistic diversity).

The project would therefore provide a 'state of the nation' review of efforts in this space, consulting (e.g through open workshops) with those in industry already leading, and provide recommendations in the form of guidelines on best practices for the documentation of datasets for use in AI system development and deployment. The guidelines would act as a "checklist" for busy professionals leading the deployment projects that either use or generate data resources, their managers, and their executive managers. Potential uses include, but are not limited to, streamlining the creation of datasets for reuse in AI contexts (e.g., open data, government data) or facilitating waypoints in fast-paced corporate projects that allow the team to slow down and ensure the AI system will not fall prey to known data governance issues.

3.2 A definition of the project in terms of what we need to know (cutting edge research) or create (an applied AI project)

While some experts may have a good idea of the general elements that contribute to a well-managed data governance approach to AI systems development, many skilled practitioners still develop and deploy AI systems that do not adhere to these basic principles. This project aims to develop a reliable checklist for use by AI practitioners to help users steer clear of errors that can be easily avoided. This "checklist" approach has proved useful to surgeons, pilots, and others who operate in highly complex domains. Developing and testing this checklist is the primary goal of this research task; however, a secondary goal is to identify areas that trigger mistakes because we don't know enough to avoid these errors. Highlighting these areas will allow the second phase of research to focus on filling these identified gaps.

The guidelines / checklist would include provisions for:

(1) the documentation & metadata of datasets for AI projects and AI systems

- Defining a minimum information standard for source description of AI data, drawing on established practices in data documentation.
- Develop guidance on how to best incorporate data provenance and lineage in metadata to improve traceability of datasets. Review work of initiatives in this field and collaborate on defining good practices and standards for this information.
- Define how intellectual property rights and licencing issues relevant to the data are presented in the documentation

(2) data characterisation documentation and suggestions for alignment for each project or system. For example, guidance would be provided for the following types of questions:

- How to define a desired data use case for the project/system, i.e. what data is needed to reach the aims of the project/system to ensure that data selected is fit for use.
- How to identify data sensitivities, to include legal and regulatory issues relative to the use case and work to mitigate these.
- How to assess existing data for completeness (for re-users) and ensure the completeness of data that is created.
- How to undertake data improvements and manage data generated by the AI system.
- How to effectively prepare and distribute datasets (e.g., including licenses in the metadata).

(3) data creators regarding the provision of transparency for data users around the creation and contents of the dataset, to enhance trust in these data resources and their use. The work would include a focus on:

- Data representativeness and coverage. Clarify whether there are issues with representativeness and coverage in the dataset, and if relevant list the steps that have been taken to manage (and ideally eliminate) bias in the dataset.
- Data accuracy and relevance. Clarify the actions that have been undertaken to verify the accuracy of the data.
- Define the legal and ethical issues that have been identified relating to the data and how have these been resolved.
- Develop trusted mechanisms (e.g., certification badges, dataset user ratings and data creator or broker reviews) for displaying that datasets have undergone processes that incorporate the above checks.

It is essential that these checklists be accessible to development and deployment leads, their managers, and key stakeholders. The checklists may also need educational material to be developed to ensure that managers of companies (from first-level to executive leaders) can understand the relevance of these checklists and their implications.

3.3 An outline of the intended impact of the project long term and outcomes expected by the end of the project

The target audience for these guidelines would be those that use datasets to train / test / operate AI algorithms in prototyped and deployed AI systems, and their managers. There are distinct obligations that come with this

activity, including specifying their expectations for training (and running) the algorithm, how they will ensure (e.g., through data profiling, anomaly detection) that those expectations are being met, and what they will do by way of compensation (e.g., default values, exclusion of records) if that does not happen.

These guidelines would be designed to create transparency around the lifecycle of the dataset. This would include tracking dataset provenance (that is, who has accessed or touched the data since its creation), authentication (e.g., whether there is appropriate authorisation of the use of such data through mechanisms such as consent), and usage (e.g., who, inside and between organisations uses the outcomes of AI systems derived from data, which becomes future training data in many cases). In other words, the developed guidelines / checklist will directly impact the organisational dimension (stakeholders, users, processes, responsibilities) and will need to ensure it enables effective end-to-end accountability and governance structures so that it can respond to the new requirements arising from using data in AI.

Accordingly, the guidelines will serve to strengthen an international multi-stakeholder alliance to facilitate digital public good sharing (e.g. perhaps through a shared platform). They will identify a simple-to-use framework that may aid in future efforts to pool data sets, while respecting privacy in areas related to attaining the Sustainable Development Goals (SDGs) with special emphasis on full digital inclusion and digital equality for women and traditionally marginalized groups. Furthermore, this work aligns well with the SDGs, which are essential lenses that measure the advancement of the GPAI's overall mission. In fact, the Agenda for Sustainable Development strengthens the commitment 'to support and guide the responsible adoption of AI that is grounded in human rights, inclusion, diversity, innovation, economic growth, and societal benefit' (see SDGs 1.4.1, 9.5.2, 12.a, and 17.6.1, which fall in line with the scope of this project).[2]

It is worth noting that such concepts for managing datasets, as they are, are handled by multiple stakeholders and have been around for years. Some organisations have attempted to implement them within their boundaries; however, due to the importance to AI systems and spotty implementation, there is a strong case that the DGWG could contribute to the advancement of these principles. The assessment of the 'state of the nation' will help in the currently nebulous area by answering key questions of "What is out there?" and "How effective is it?" The promotion of common checklists may also help promote better communication between data owners / custodians and the user community. At a minimum, many less mature organisations could benefit from practices developed in more mature companies (for whom this is "baked into" their business model) through the GPAI DGWG's sharing of best practices.

3.4 A definition of the more specific outputs, activities and success measures for the project

Guidelines/Checklist would answer questions such as:

1. Technical items (e.g., Have you checked the distribution of training data as it pertains to various

[2] **SDG 1.4.1**: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance; **SDG 9.5.2**: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending; **SDG 12.a**: Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production; **SDG 17.6.1**: Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge- sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism

biases? Scheduled model drift checks?)

2. Have you followed XYZ guidelines / regulations (e.g., a privacy impact assessment, Canadian implementation - Algorithmic Impact Assessment Tool)?
3. Have you created X? Have you documented Y? Have you tested or certified Z?

4. Creating global rules for copyright exception for text and data mining (TDM)

This concept note was led by Dr. Maja Bogataj Jančič and Matija Damjan, with contributors including Naoto Ikegai, Jeni Tennison, Dewey Murdick, Jaco Du Toit, and Christiane Wendehorst.

4.1 A description of the challenge that needs to be solved and background on what's known so far

In order to achieve AI development and to train AI algorithms, a large amount of data (big data) is required. In the context of AI innovation, the term »data« refers to information from or about a variety of sources, including text, images, sounds, etc. that is processed covers data that may easily be transformed into digital data or that otherwise allows processing by machines – data as a representation of information. IWith this in mind, it is through data analytics that large amounts of data are reduced and transformed into specific information processed by machines. The information (data) in this sense is generally acknowledged to be a fact about the source studied. As such, the data cannot be subject to embedded in a given work or piece of content (e.g. a scientific article) is not "owned" by any copyright holders that may exist for the source being studies. But to create such data, actions may need to be taken with respect to the studied material that some claim implicates exclusive rights of copyright owners, requiring their permission. The resulting ambiguity in legal interpretation , yet copyright can create impediments to the proliferation of AI technology world wide.access and use that information in a digital context.

Automated computational analysis of information in digital form is often referred to as »Text and Data Mining – TDM in a legal context. «. Text and digital data mining may technically require or involve a more comprehensive copying of datasets including copyright works, thereby resulting in a copying of the creative elements of such works, which makes the legality of such processes unclear. The copyright status of each piece of data cannot be easily determined by algorithms. Due to the large amounts of data processed, acquiring copyright licences for TDM is impractical to the extent that it renders TDM operationally impossible. Yet, in most cases, the use of copyrighted works under TDM is of a transitory nature and does not unreasonably prejudice the legitimate interests of copyright holders. Therefore, copyright exceptions or limitations that ensure the legality of TDM without acquiring specific licences from copyright holders provide legal certainty, which is absolutely essential for researchers, research institutions, governments, NGOs and businesses that are involved with data analytics all around the world. TDM exceptions and limitations are meant to bridge the gap caused by different legal jurisdictions with respect to research.

The main issues this project is facing are:

- in some jurisdictions, such as Japan, Estonia, Germany and UK, specific copyright exceptions or limitations have been created for the TDM;
- EU Member States will have to implement TDM copyright exception and limitations the latest by 7 June 2021 when the new DSM Directive has to be implemented;
- many countries do not have a TDM copyright exception and limitation at all, so the legality of TDM from the copyright law perspective remains doubtful;
- among the countries that have introduced TDM copyright exceptions and limitations, there are substantial differences in how they ensure the legality of TDM (some have legislated specific copyright exceptions and limitations, others rely on general exceptions fair use doctrine etc.);
- the disparity between legal systems in this regard creates legal uncertainty for TDM operators since

both the operation of TDM and its result may be deemed to infringe copyrights;
- as of yet, there is no uniform global legal instrument (e.g. International Convention of Copyright exceptions and limitations for the TDM) aimed towards global uniformity of the TDM exceptions and limitations for copyright regulation; and
- bilateral and plurilateral trade agreements are now starting to deal with E-Commerce issues, which could have an effect on AI / TDM policies. issues potentially conflicting with TDM copyright laws and reverse engineering provisions in existing laws that support innovation.

This project aims to demonstrate the seriousness of the above mentioned issues by identifying concrete legal risks for TDM operation due to potential copyright infringements. The project will provide an overview of jurisdictions that have introduced TDM exceptions and limitations or allow TDM under general exceptions fair use provisions. A comprehensive overview of existing studies which compare these solutions will be carried out or additional study will be conducted to identify the disparities between the conditions under which TDM is allowed. A list of jurisdictions that do not have such exceptions and limitations, will also be compiled given the importance of AI to the development agenda. The project will also demonstrate the need for harmonisation in this field and will aim to identify international organisations and/or bodies that would lead the initiative for such harmonisation.

In the past few years, there have already been some initiatives from different research groups that called for appropriate research copyright exceptions, as well as some research projects dealing with such issues.

For example, 15 civil society organisations drafted the Treaty on Copyright Exceptions and Limitations on Education and Research Activities[3], which was endorsed on 25 September 2018 at the global congress “IP and the Public Interest”[4]. TERA represents an international instrument that would ensure minimal standards of exceptions for educational and research purposes, while at the same time enabling countries flexibility in how to implement the obligations. Additionally, the Program for Information Justice and Intellectual Property[5] has already conducted a Survey of National Copyright Exceptions for Research[6], and they have also issued a public call for action on international level to WIPO to deal with these issues[7]. Additionally, the European Commission expert group has conducted research on stakeholders' views, economic issues and legal issues with respect to TDM in Europe (Standardisation in the area of innovation and technological development, notably in the field of Text and Data Mining[8]). In EU, we have also seen an open letter by the European Research and Innovation community addressed at the EU Parliament advocating for better TDM exceptions[9].

All the above listed initiatives and projects indicate that there already exists a will and a need for an improved and more uniform TDM and research copyright exception, and the GPAI DGWG would do well to build on

[3] TERA, http://infojustice.org/wp-content/uploads/2018/11/tera11152018.pdf
[4] http://infojustice.org/globalcongress2018
[5] PIJIP, https://www.wcl.american.edu/impact/initiatives-programs/pijip/
[6] See https://www.wcl.american.edu/impact/initiatives-programs/pijip/news/professor-flynn-presents-pijip-survey-of-national-copyright-exceptions-for-research-to-the-world-intellectual-property-organization/, https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/conversation_ip_ai/pdf/ngo_global_expert_network_copyright_user_rights.pdf , https://www.youtube.com/watch?v=sCG5X0iwSx8&feature=youtu.be
[7] https://infojustice.org/archives/42260, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3578819, http://infojustice.org/archives/42009
[8] http://ec.europa.eu/research/innovation-union/pdf/TDM-report_from_the_expert_group-042014.pdf
[9] https://www.scienceeurope.org/media/ez0nadd1/joint_open_letter_on_tdm_september_2017.pdf, https://eare.eu/open-letter-securing-europes-leadership-data-economy-revising-text-data-mining-tdm-exception/, https://eare.eu/european-parliament-must-improve-text-data-mining-tdm-exception-benefit-european-research-innovation/, https://libereurope.eu/article/liber-joins-call-better-tdm-exception/

those by providing a farther-reaching voice for the international community in order to achieve a more research-centered legal landscape.

4.2 A definition of the project in terms of what we need to know (cutting edge research) or create (an applied AI project)

For this project to be successful, GPAI DGWG will have to acquire knowledge on:

- Which legal jurisdictions across the world already have a copyright exception for TDM;
- Which legal jurisdictions across the world do not (yet) have a copyright exception for TDM;
- In which legal jurisdiction a copyright exception for TDM is imminent (e.g. EU Member States);
- Differences between the jurisdictions that have TDM exceptions and limitations;
- Identification of optimal existing regulation of the TDM copyright exceptions and;
- Where copyright exception for TDM exists: who are the beneficiaries, what are the purposes of use, how broad is its scope, what are its characteristics, other conditions (e.g. storage requirements, reuse option, remuneration etc.);
- Identification of potential legal risks for TDM arising from differences between the scope and conditions of TDM exceptions and limitations;
- Identification of cases/conditions where TDM may conflict with a normal exploitation of the work and or could unreasonably prejudice the legitimate interests of the author (Berne three-step test).
- Identification of international legal instruments (e.g. Conventions) that are appropriate to regulate the issue on a global scale, and international organisations that could introduce such instruments.
- Develop model laws, trade or other international law provisions, guidelines, and other advice for countries in adopting copyright policies that promote and enable TDM needed for AI projects.
- Identify cases where free trade agreements are conflicting with TDM exceptions or undermine other AI related exceptions such as reverse engineering, cryptography etc.

The GPAI DGWG is an optimal platform to highlight the importance of the above mentioned issues, and to stress the need for globally uniform TDM research rules, with its insight into AI field, the requirements of AI development, the broadness of AI-field, and with its connections with important stakeholders in the field of AI and its representation.

The DG WG's research should be of interest to the following stakeholders: (a) researchers; (b) research institutions; (c) businesses (d) copyright holders and their associations i.e. collective management organizations; (d) government / inter-governmental agencies tasked with encouraging responsible innovation in AI (e.g. to encourage competition, meet SDG's).

4.3 An outline of the intended impact of the project long term and outcomes expected by the end of the project

The primary **long-term objective** is to demonstrate the urgency of creation of harmonised global rules for copyright exception for TDM and ensure that they are implemented as widely as possible, which would create a global level-playing field for TDM researchers and also TDM for all other subjects (i.e. businesses, governments, NGOs..). It is no secret that countries with looser TDM/research restrictions create a harbour for researchers and businesses allowing them to develop TDM technologies and utilise TDM to a significantly

greater extent than in jurisdictions that restrict TDM more. By adopting uniform global rules for broad TDM copyright exceptions, the gaps between such countries would be bridged, the fast pace of digital world development would be matched, and obstacles for cross-border research and TDM would be overcome. It is also important for countries not at the forefront of AI developments to through the exercise of exceptions for TDM, reverse engineering etc be able to compete more effectively with the AI leading countries such as US, Japan and China.

This project and its goals is in line with the GPAI's and Data Governance Working Group's mission to "*to bridge the gap between theory and practice on AI by supporting cutting-edge research*" and to "*promote data for AI being collected, used, shared, archived in ways that are consistent with human rights, inclusion, diversity, innovation, economic growth, and societal benefit*".

The project is important also for the DG WG on Commercialization and Innovation since it covers very important aspects of provision of legal certainty for machine learning which is essential in creation of AI.
.
In addition, several of the UN SDGs will be positively affected by this project: Quality education (4), Decent work and economic growth (8); Industry, innovation and infrastructure (9); Reducing inequalities (10); Sustainable cities and communities (11); Peace, justice and strong institutions (11), and Partnerships for the goals (17). By providing such a uniform and global guidance for TDM copyright exceptions, the OECD Principles[10] will be promoted as well.

[10] https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449

5. Squaring the circle of achieving an innovation-friendly climate and a high level of protection in data privacy law

This concept note was led by Bertrand Monthubert and Teki Akuettah Falconer, with contributors including Yeong Zee Kin, Christiane Wendehorst, and Josef Drexl.

5.1 A description of the challenge that needs to be solved and background on what's known so far

"Data-intensive technologies such as AI and the Internet of Things (IoT) offer greater consumer choice and personalisation. At the same time, they pose new risks to safety, privacy and security, and may discriminate against disadvantaged groups such as women and ethnic minorities. Already in 2019, over 80% of OECD countries reported AI and big data analytics as the biggest challenges to privacy and personal data protection, followed closely by the IoT and biometrics. Against this backdrop, governments are implementing policies to raise awareness about privacy and data protection frameworks and strengthen their enforcement, while promoting accountability for data controllers. OECD countries are also seeking policy solutions to address digital security issues and incentivise good practices. These efforts take on additional importance as economies and societies move steadily on line." OECD Digital Economy Outlook 2020

The collection, use and sharing of data is central to building an innovation-friendly climate, at the same time, the value and significance of data and personal data calls for stringent access and use of such information, thereby creating tension. The challenge is whether an innovation-friendly climate can co-exist with a high level of privacy protection?

In the examination of this question, it is necessary to commence by identifying which aspects of privacy that individuals are most sensitive to, when their data is to be used for innovation. For example, are individuals concerned about being identified from the research dataset, or is it their concern that the amount of data that will be collected and used for the innovation project is too extensive, or is the nature of data that is involved for the innovation too personal or intrusive. The expectation of privacy may differ and a better understanding of the nature and extent of privacy concerns will help us begin to craft solutions.

It is also necessary to understand the type of innovation that individuals are concerned about. For example, more may be content to allow their data to be used for upstream research that is directed as advancing science and technology, while some may feel less inclined when the innovation is closer to market in the form of product development for commercialisation. It is also necessary to define when innovation ends and commercialisation commence, for example, personalisation of product features using historical data may not be viewed by many consumers as innovation, however innovative the results may be.

In defining the scope of solutions that are to be crafted, it is also necessary to consider what is meant by an innovation-friendly climate. Policies and regulations will no doubt be relevant, but it is important to consider the role played by regulatory institutions, e.g. data protection authorities, as contributing to the climate. For example, the UK FSA and ICO's regulatory sandbox programmes do set a certain pro-innovation tone. Climate can also include other policies like availability of funding, support through research institutions, etc. It will be necessary to delineate that our recommendations will primarily be around policies/regulations and policy makers and regulators, in order not to be overly broad.

In line with the above, there is the need to peel back the many layers to understand in greater detail:

(a) The different stages of research, innovation and commercialisation;
(b) Public attitudes toward privacy and the necessity for its consideration during the various stages of an innovation process; and
(c) How individuals are prepared to participate with the contribution of their data.

By identifying the issues using this analytical frame, we will be able to proffer solutions that enable innovation while still respecting privacy as a human right. Among the many questions that may be answered through this process includes:

- An understanding of what is really at stake when we want to protect privacy?
- An understanding of what is really at stake when we want to support innovation - as the lack of confidence in digitalization actors is also a brake to innovation.
- An understanding of whether a renewed vision of privacy protection be a leverage for confidence thus for the adoption of innovative products and services?
- Whether it is possible/necessary to distinguish between the objectives of innovative projects, i.e. give more freedom to projects which fulfill general interest like the SDGs.
- Taking into account the impact of the differences in the regulations in the world and whether it leads to different innovation dynamics.
- An understanding of the kind of information that leads to biased datasets used to train AI.

5.2 A definition of the project in terms of what we need to know (cutting edge research) or create (an applied AI project)

What we need to know:

- What is innovation and an innovation-friendly climate?
    - Innovation begins with research for the advancement of science and technology, continues into the translation of these advances into tangible products and services (whether totally new products/services or new/enhanced features) and eventually the delivery of these into the hands of the public (whether through commercial or non-commercial means).
    - The need and the use of data at each stage will be different; and the extent to which individual members of the public are prepared to allow their data to be used will also be different. We need to identify the different interests that individuals weigh (eg privacy, altruism) in order to start designing solutions.
    - The needs of research institutions (both commercial and academic) and corporations engaged in innovation activities are also different at each stage of the research, innovation and enterprise journey. Identifying their data-related needs and risks that they face at each stage enables a

better understanding, in preparation for designing solutions.

- What is really at stake when we want to protect privacy: when is it possible to use personal data while respecting individual privacy? Does data use related to the fulfillment of SDGs provide more support from citizens? Are the OECD Principles on Responsible AI providing a better confidence according to citizens?
    - Innovation takes place across all public and private sectors. The extent to which the public is willing to support innovation in different sectors (or areas of science) may also differ. Using the SDGs are a reference, we need to find out whether there is greater support to use data to support innovation in furtherance of SDG, in contrast with innovation in other areas. This provides another dimension to the problem and the possibility of developing different principles or calibrating common principles differently, to support innovation to promote SDGs.
- How do people adjust their acceptance of using their personal data according to the organization making the operation, and the purpose of the operation?
    - We need to obtain a deeper understanding of the specific issues about the use of data that individual members of the public are concerned about, at each stage of the innovation journey. The concerns could be over, for example, the extent or granularity of data that is required, the nature or sensitivity (privacy?) of the information, or the time dimension, i.e. providing longitudinal data over an extended time period for the research/innovation/commercialisation.
    - Establishing whether these concerns are viewed and held to different levels for different stages of the innovation journey, and also for different innovation goals (eg SDG).
    - Establishing if the public would consider differently the use of their personal data depending on the status of the organization that would use it, e.g. public research center, private company, or a governmental organization as examples.

The aspects of innovation, privacy & data protection and how they shape the innovation-friendly climate could be explored through surveys, etc. In order to obtain this knowledge, an international survey on the perception of the issues of data privacy should be conducted. Some surveys already exist at local level, but a common one would be very useful in order to integrate the toolbox presented below.

What we need to create:

- A framework to analyse the different dimensions of the innovation vs privacy dilemma. The framework could include dimensions that are validated through the survey. Some of the dimensions include:
    - What is the objective of the innovation: eg furtherance of SDGs or other areas.
    - What stage of the innovation journey: eg upstream research, innovation that translate research into potential market products, or commercialisation by enterprises
    - The types and nature of data that is involved: eg anonymised vs identifiable data, sensitivity of the data, extent of data involved (both in terms of breadth of data elements and the time-dimension) -- consideration should also be given towards machine and non-personal data

- Process and other controls that are accessible and can be adopted, eg ethics and risk frameworks, risk assessments, data sharing processes and institutions (eg data trusts). Different processes or other controls that are identified can address different types of problems and used effectively to address the issues identified in (i), (ii) and (iii).
- Principles that capture the public attitudes and sentiments can be articulated and promoted globally, to assist with interoperability across different legal and regulatory regimes. Examples (illustrative purpose only):
  - Use anonymised data first, and resort to using identifiable data only when research objective cannot be achieved using anonymised data
  - Using identifiable data is justifiable for innovation if it is intended to address harms and risks, eg de-biasing,
  - Data sharing (ie pooling) is permissible to support innovation in furtherance of SDGs.

- Identifying the elements that an innovation-friendly climate requires.
  - Policies and frameworks are just the start.
  - To build an innovation-friendly climate, it is also necessary for policy makers and regulators to adopt a pro-innovation posture, which may include introduction of programmes like regulatory sandboxes to support innovation.
  - Additionally, policies are needed to address issues of inclusion and inequality, to ensure that workers have ample opportunities to participate (eg skills upgrading, career progression) and consumers have the ability to enjoy the benefits.
- A toolbox for innovators which will help them develop their projects while respecting a high level of privacy protection. This toolbox could be composed of several parts:
  - A synthetic, easily readable documentation of the various legislations applying to their projects, in terms of privacy and the acceptable legal bases for research and development. This documentation would help making correspondences between the requirements of various legislations.
  - A collection of template privacy impact assessment, data transfer agreements, questionnaires or checklists that can assist the cross-border transfer of data to support research and innovation projects that involve researchers and/or participants across two or more jurisdictions.
  - A presentation of technical solutions available to respect each requirement in order to simplify the way the projects could respect the rules. These technical solutions should fulfill the OECD Principles on Responsible AI
  - A mapping between the requirements of the various regulations and the technical solutions
  - A map of data altruism initiatives
  - A synthesis of the international survey of the perception of the issues of data privacy

5.3 An outline of the intended impact of the project long term and outcomes expected by the end of the project

Many organizations acting to fulfill the SDGs need access to personal data, and are refrained from it by various regulations. Not knowing clearly what is legitimate to do, what is the perception of citizens, and what tools they could use, is clearly a brake to the development of many projects.

With the project above we should gain:

- Better understanding of the issues of privacy by parliaments, so that they can adapt the legislation to really fit the wills of their citizens
- Better understanding of the issues of privacy by companies, in order to choose which data operations they can process
- Better knowledge of the solutions adapted to each legal requirement, in order to choose which technical tool to use, respecting the OECD AI Principles and Recommendation on Responsible AI
- Development of technical solutions compliant to legal requirements, which help achieve the UN Sustainable Development Goals

6. Formulating transnational legal principles governing rights in co-generated data and third-party data

This concept note was led by Christiane Wendehorst and Josef Drexl, with contributors including Carlo Casonato, Alison Gillwald, Naoto Ikegai, Carole Piovesan and Oreste Pollicino.

6.1 A description of the challenge that needs to be solved and background on what's known so far

It is more or less common ground that rights with regard to data do not necessarily resemble the rights that have developed with regard to tangible property or intellectual property (IP), to name only two potentially relevant regimes of protection. The main reason why rights in data do not resemble rights in tangible property is that data are a non-rival resource that can be simultaneously used by multiple persons. Hence, data sharing has the potential of increasing economic welfare. Similarly, general recognition of IP-like protection for any data would run the risk of limiting access to data and could undermine data access and use by third parties. These are considerations applying to the regulation of the data economy in general. But they are also particularly important for data governance in the context of AI where access and use of data for the purpose of training AI is key.

In addition, the features of value generation in the digital economy differ considerably from the analogue economy. Whereas the latter is characterized by value chains, in the digital economy value is generated within network structures of multiple actors who contribute in various ways to the generation and processing of data. This raises the question of how to allocate the rights regarding access and use of data as well as the duties to guarantee the quality of data and the technical portability and sharing of data.

It has by now become common practice to use the term of co-generated data (originally coined by the American Law Institute, ALI, and European Law Institute, ELI) where data is generated and used in the digital economy in such network structures. However, what co-generation of data entails will typically in legal terms depend on the concrete context. Hence, 'co-generation' of data can hardly be captured in general terms. This may argue in favour of leaving it to the stakeholders concerned to decide on the allocation of rights and duties in the abovementioned sense by making use of contract law.

However, contract law is not sufficient for mostly two reasons: First, the question of who can be considered a 'co-generator' of data cannot be answered only against the backdrop of the factual situation. In particular, the law has to take account of the legitimate interests of the various stakeholders, including data protection and consumer interests, who deserve legal protection. Such interests also need to be protected and coordinated when stakeholders are not sufficiently capable of taking care of their interest through contractual transactions. Secondly, depending on the context, the legal relationships between different co-generators are often highly complex, and data are often generated without contractual links between all stakeholders.

This explains why the ALI and ELI, in their draft 'Principles for a Data Economy', developed the concept of 'rights in co-generated data', which are access or porting rights, rights to require desistance from data use, deletion or correction of data, or rights to share in the profits derived with the help of data use. The concept as such has already gained broad recognition and has been taken up, inter alia, by the European Commission in its 2020 data strategy and by the German Data Ethics Commission. It has also been recognized in the GPAI's framework paper for the Data Governance Working Group. Similarly jurisdictions currently explore and adopt

legislation for new data rights regarding data access and use in the context of the digital economy. However, such rules are often adopted against the backdrop of specific business models of the data economy or a particular technological context, such as the Internet platform economy or connected devices, although these rules may be applicable more broadly. Whether such rules are also adequate in the context of an AI context remains largely unexplored. Thus, the question is how rights related to co-generated data should be appropriately designed in an AI context where different stakeholders contribute to the development of AI and where AI generates new data.

In the international context, the challenges are even greater. Data access and sharing for the purpose of AI development should also work transnationally. To allocate the rights and duties transnationally, contract law may appear as the most suitable legal means. However, as mentioned above, mandatory legal rules are also needed to protect and balance all legitimate interests. Since this is done by the individual jurisdictions, and jurisdictions even differ considerably as regards most important concerns, such as data protection in particular, there is an obvious need for transnational coordination and convergence of domestic rules.

However, data rights are not limited to co-generated data. Data rights are also vested in parties that do not contribute to the generation of the data. This is already recognized in various contexts. Under certain conditions, competition law and sector-specific regulation may give rise to data access rights of competitors. The law of many jurisdictions provides access of the private sector to public sector information for the purpose of commercial re-use. Such third-party data rights also matter in the AI context, since access to data held by others will often be needed for the training of AI. The advent of AI also drives the debate on government-to-business (G2B) data access, since AI especially helps promote public interests. Accordingly, there is increasingly a call for making data access a two-way-road, also obliging private players to share particular datasets with the public sector (B2G data sharing), such as to facilitate the development of smart cities, automated driving or traffic regulation (HLEG B2G 2020). Moreover, access to data must not only be discussed with regard to individual actors, but also in the sense of data access by civil society (e.g., for accountability) and by academia (e.g., for research).

As indicated above, those issues have already been researched, but the debate is still in need of a more AI-specific and a more global perspective. More importantly, there are various aspects that seem to be so far very much underdeveloped. One of those aspects is rights to require desistance form data use, deletion or correction of data by parties who have not had a share in the generation of the data but who are nevertheless affected by the data use (Tennison 2020). E.g., an algorithm may have been trained with the data of individuals X_1 to X_{99}, now allowing quite granula inferences to be drawn with regard to individuals X_{100} to X_{999} who share particular personal characteristics. So far, this phenomenon has rather been addressed from the ‘responsible AI’ perspective, and not so much from the data governance perspective, but it would be important to find out whether it is also possible or even necessary to conceptualize it from a data-focused point of view, and what that could mean in practice.

Closely related is the question of whether, and under what conditions, collective data rights should exist. The question may arise whether rights in co-generated data should be vested not in individuals but in groups of individuals, such as defined by language (e.g. for speech data), ethnic origin (e.g. for genetic data), or activities (e.g. data from connected vehicles). Collective data rights, too, could mean access or porting rights, rights to require desistance, deletion or correction, or rights to a share in profits derived. There are important debates concerning indigenous data rights and ‘data colonialism’, and collective data rights could be key to a solution.

However, we still need to conceptualize who counts as part of a relevant group, what is the nature of such data rights, and who may exercise them. It is also clear that, in line with the collective nature, entirely different means to implement such rights (e.g. taxation) must be explored.

6.2 A definition of the project in terms of what we need to know (cutting edge research) or create (an applied AI project)

We need to know:

- Whether the concept of co-generated data (as developed by the ALI and ELI) as well as existing concepts of access rights with regard to third-party data are sufficiently adapted to the AI context, and if not, how they could specifically be adapted to that context;
- Whether principles formulated for general data access rights take into account the specific requirements of AI as a technology and the interest in developing and using AI from a public interest perspective, and if not, how they could be adapted;
- How existing concepts of rights in data can better reflect the multi-relational nature of data and data use, and whether and under what conditions collective data rights should be recognised, what they could look like, and who would be entitled to exercise them;
- What is the state of the art concerning data sharing technologies (e.g. granting access to data in secure environments) and data sharing facilitators (e.g. data trustees and other intermediary services), and who has access to them; and
- How general guiding principles for the formulation of domestic rules on third party data access should be designed as a basis for more transnational coherence.

We don't have:

- Technical and institutional solutions suitable for mass roll-out that facilitate data sharing among different actors without putting third parties at risk;
- Principles of data rights that combine co-generated data, open data in the public sector, and the existing sector-specific approaches, identifying cross-cutting issues and overarching patterns and
- Blueprints for legislation beyond general principles.

International demand would potentially be huge, given that the majority of legislatures and judiciaries globally are currently grappling with the issue of data access and data use, and that the inequalities between actors in the data economy, including inequalities between different regions globally, are a growing concern.

6.3 An outline of the intended impact of the project long term and outcomes expected by the end of the project

The project seeks to contribute to transnational convergence of national laws as regards the design of data rights and their allocation. While it is true that globally jurisdictions rely on very different value judgments and objectives for regulating the digital sector, the project should rely on the values and goals of GPAI, i.e. human rights, inclusion, diversity, innovation, economic growth and societal benefits, as well as the UN Sustainable Development goals as guidance for the formulation of principles concerning data rights. Thereby, beyond legal convergence as such, the project is designed to promote said values and goals. By also addressing the

technological prerequisites of data sharing, the project would also help guarantee that data governance structures for the purpose of AI development promoting said values and goals will develop transnationally.

7. Supporting the development and adoption of trustworthy privacy-enhancing technologies

This concept note was led by Shameek Kundu and Kim McGrail, with contributors including Dewey Murdick, Paul Dalby, and PJ Narayanan.

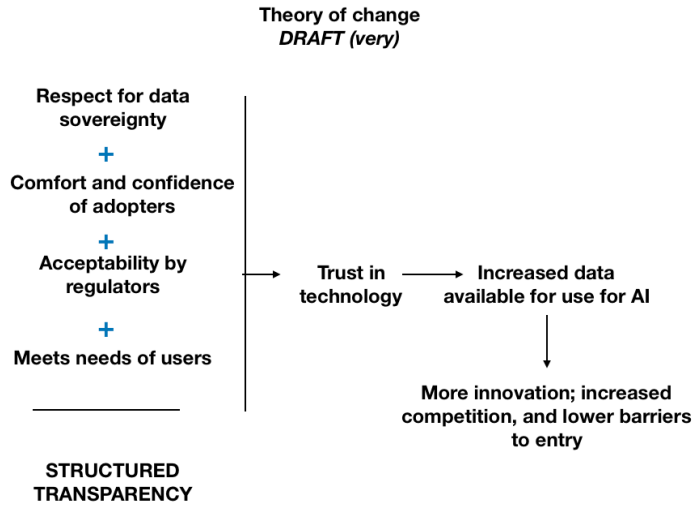
7.1 A description of the challenge that needs to be solved and background on what's known so far

Training AI algorithms requires data - lots of it, from multiple organisations, spanning multiple countries. Sharing data across organisations/ nations, or even using data already present inside an organisation to train AI algorithms, requires attention to several interrelated issues:

1. Privacy: Attention to the identifiability or potential identifiability of individuals represented in data
2. Sovereignty: Respecting company, government, community, individual and Indigenous rights to govern and control use of data
3. IP protection: Recognition of and respect for any property rights inherent in data
4. Data security: Ensuring safe handling and housing of data throughout the data life cycle
5. Data travel: Legal requirements, size of data sets, and other considerations may limit the movement of data from their originating location

Technology will be part of any solution, and must be developed to meet operational needs and objectives while respecting laws, ethical principles and values as expressed by users and data subjects. The aims of this project are:

(A) Assess the current maturity and impact (to date) of technology solutions;
(B) Identify barriers to further development and adoption; and
(C) Propose initiatives - e.g. research, building of standards, incentives for adoption, supporting changes to legal and policy frameworks - that can help overcome these barriers



7.2 A definition of the project in terms of what we need to know (cutting edge research) or create (an applied AI project)

There are a range of inter-connected “privacy-enhancing technologies” or PETs that could help meet this challenge, including but not limited to:

- Differential privacy: techniques to ensure that make it difficult to identify, by looking at a data set, if the data on a single individual was included in the input data set
- Federated learning/ secret computing: techniques to train an AI algorithm across a decentralised set of data samples, without having to exchange those samples. This can help both with privacy and sovereignty concerns
- Homomorphic encryption: a form of cryptography that enables computation on data encrypted using an algorithm, so that the generated encrypted result exactly matches the result of operations that would have been performed on unencrypted text
- Personal data wallets: tools to allow individuals to manage who has access to their personal data, under what conditions
- Distributed consent management: tools that enable organisations to reliably know whether they have a data subject’s consent to use a particular piece of data, for a particular purpose, without having to directly approach the data subject

The intended effect of the use of these technologies, however, extends beyond a focus on privacy to the emerging concept of “structured transparency”.

Despite the rapid development of technological capabilities, our hypotheses are that actual deployment and adoption of such technologies remains relatively limited, and that where they are being used, they tend to be ad-hoc/ experimental and piece-meal in nature.

We need to confirm if these hypotheses are correct, and, if so, build a comprehensive understanding of:

(A) The technology landscape in this space (what, who, how effective in practice)
(B) The reasons behind the limited adoption to date (immaturity of technology? Lack of standards? Misalignment of incentives? Inadequate ‘size of the prize’? Opposition from specific groups?)
(C) The scale of potential impact if such technologies were to become more widely adopted

The GPAI DGWG will be well-positioned to make a robust case for greater public (and private) R&D investment and/or investment in technology implementation in this critical space, through a broad-based review of the 'state of the nation'. Such an exercise would include not just a review of relevant research but also a public consultation with relevant technology providers and adopters to provide practitioner perspectives. The combination of this work will address project aims A and B.

Additionally, and in line with Aim C, if one of the other GPAI workstreams present a topical use case, this initiative could also include a practical demonstration of the implementation and impact of such technologies.

The DG WG’s research should be of interest to at least three sets of stakeholders: (a) commercial and public sector organisations or other groups that are struggling to overcome the challenges around data availability /

usability / sharing when building AI applications; (b) government / inter-governmental agencies tasked with encouraging responsible innovation in AI (e.g. to encourage competition, meet SDGs); (c) technology vendors (start-ups *and* established) that have research/ IP/ early products in this space but are struggling to see a path to commercialisation.

7.3 A definition of the more specific outputs, activities and success measures for the project

The primary **long term objective** is to increase the availability / usability of AI systems by providing a means to safely develop and use data sets while preserving privacy, sovereignty, IP rights, and security for public good projects. For example, UN SDGs around good wealth/ well-being (3), responsible consumption and production (12) and climate action (13) can all benefit from AI applications that in turn depend on the availability of data sets to train and test. However, individuals, researchers, corporations and governments do not necessarily have the incentives to make such data available due to concerns around loss of privacy, IP or sovereignty. Trustworthy technology solutions to address such concerns will make it much easier to make such data available for use.

The long-term objective reflects the mission of GPAI and the Data Governance working group, and reflects an assumption that greater data availability will support innovation and improve competition for data/ analytics-enabled products and services, all with public benefit. More friction-less data sharing between organisations and/or countries will enable learning and innovation in general. It will also support smaller organizations or corporations to compete more effectively with large (and sometimes monopolistic) data-rich organizations that have access to massive datasets within their organisational boundaries.

There are three expected **project outcomes**

- Greater awareness of, and (where appropriate) confidence in, technology solutions to address privacy/ IP/ sovereignty concerns - among data owners/ custodians, AI developers and adopters, and regulators
- Guidelines on further development and adoption of such technologies (which could translate into international standards); OR Minimum specifications for technologies that are deemed to address structured transparency.
- (Potentially) A practical demonstration of how such technologies can help improve data availability for AI use cases beneficial to humanity, in collaboration with one of the other GPAI workstreams

8. Data Justice for Beneficial AI - Beyond Data Protection to Data Equity

This concept note was led by Alison Gillwald, with contributors including Alejandro Pisanty, Te Taka Keegan, Jaco du Toit, Gabriella Razzano, Anri van der Spuy, and Andrew Rens.

It has shaped the development of the "Advancing Research and Practice on Data Justice" project.

8.1 A description of the challenge that needs to be solved and background on what's known so far

Awareness about the value of data for socio-economic development and their ability to contribute to the realisation of the UN Sustainable Development Goals (UNGA, 2015) has become increasingly prevalent. With the global crisis precipitated by COVID-19, the growing dominance and linkages of data, big data analytics, the Internet of Things and algorithms have placed data as a key resource in public health management and economic reconstruction. This has amplified the need for data governance and institutional arrangements to reduce the current unevenness of digitalisation and datafication within, and between countries. The emerging literature and practice of data governance have mostly been viewed and been undertaken from a negative regulatory perspective. That is to say it has sought to prevent harms in relation to rights violations and mitigate associated risks - particularly privacy and security but also freedom of expression. Yet, while various global and local epistemic communities are grappling with these issues, increasingly in relation to artificial intelligence becoming the next general purpose technology, very little of this has focused on economic governance.

Yet, there are many areas of data governance such as data availability, accessibility, usability, integrity, as well as concerns about ownership, impacts on trade and competition (OECD 2019) that require positive regulatory or governance intervention. Balancing current commercial, supply-side valuation of data used in the allocation of resources currently that has produced these outcomes, with the demand-side valuation in the allocation of resources that recognises their social value including as common goods (Frischmann, 2012).

Some of the reasons for this lack of attention to economic regulation (and to the neglected area of demand side value of pooled resources) relate the heterogeneity of data and the complexity of the governance of different kinds of data. But through a political economy lens "…the lack of economic governance of data has at least as much to do with whose perspectives and interests dominate the data governance narrative. Keeping economic governance of data related discussions away from the policy table most suits those who currently partake of all the value of data collected from across the world, i.e. a few global digital corporations. It also serves the governments of those countries where almost all such corporations are based, the US, and now increasingly some in China." Not governing the economics perpetuates the status quo and opening up data market or data flows without enabling the fair and equitable participation of individuals, communities and countries disadvantage mostly countries in the global South "…and groups that are fast losing out in the emerging global digital economy equations, value chains and hierarchies…" (Singh & Gurumurthy, 2021, p. 1).

Largely, the focus of data governance has been on the protection of first generation fundamental rights from a primarily legal perspective. More recently governance has drawn on development literature inspired by Amartya Sen's notion of 'capabilities as freedoms', and has focused on the need for positive interventions to enable people to exercise their rights as discussed below(Nassbaum, 1988, pp. 145–184; Nussbaum, 1992, pp. 202–246, 2020, p. 1339; Sen, 1993, 1999; Walsh, 2000). This also provides a bridge to examining the second and third generation socio-economic rights that enable human development and more equitable and

just social and economic inclusion which this project will explore in relation to data governance, and AI more specifically.

It is widely acknowledged that at the heart of data governance is instilling trust in the use of data as a pre-condition for fully realising the gains of digital transformation (OECD, 2019, p. 3). In response, many have called for “data governance” approaches to enable institutional and regulatory structures to govern data in line within normative frames that assume 1) democratic and rights frameworks 2) institutional endowments to govern effectively, and 3) levels of human development that allow citizens to exercise their rights and freedoms.

These conditions do not pertain in many countries toward which the SDGs are specifically directed. And there is now considerable evidence that demonstrates that regulatory governance approaches premised on these assumptions that work in the Global North do not always apply in the Global South. This is already evident in relation to data governance (Taylor, 2017). Not only are such approaches sometimes insufficient to create the conditions for truly beneficial data and, ultimately, beneficial artificial intelligence (AI) in the Global South, but they also fail to account or prepare for the reality of contextual developmental demands - along with the risks that are introduced by the increasing production of digital traces, shadows and selves.

Any examination of the data realities in which AI is being introduced requires a wider political economy assessment with consideration of the global and domestic power relations, interests and imbalances that determine technological developments. Technological advancements, especially when coupled with large-scale crises like Covid-19, have highlighted some of the practical considerations for data governance in the public interest and some of the normative tensions in the treatment of private, community, collective information that have clear implications for AI. In the context of the pandemic and the need to prioritise collective interests, while safeguarding personal data, in the application of advanced technologies to public health management, some of these tensions have been highlighted.

The pandemic and lockdowns have also amplified the scope for the private sector to fulfil traditional public sector roles, or at least be significantly involved in their delivery (Razanno, 2020; Spuy et al., 2018) without necessarily the same accountability as the state. These partnerships create new power relations with which substantive laws have been slow to engage. In addition, many developing countries are increasingly reliant on digital giants in the Global North for the development of digital responses to a variety of problems (e.g., contact-tracing apps’ reliance on a Google-Apple API), while a handful of digital giants are playing an increasingly central role in various aspects of the digitalisation of all parts of life (van der Spuy, 2020) - leading to concerns of digital colonialism (Couldry & Mejias, 2018; Gillwald & Mothobi, 2019) and surveillance capitalism (Zuboff, 2018), along with a plethora of other risks that are unfolding in digital contexts (e.g., those related to abuse of digital dominance). These present global regulatory challenges in which cross border power evades national regulation.

The governance of these complex and adaptive systems is one of the wickedest policy problems facing states in their efforts to improve social and economic inclusion. This is problematic not just from a resource allocation point of view, but also because it could exacerbate existing socio-digital inequalities or even introduce new ones. Despite such concerns, and the focus on preventing harms and mitigation risks associated with the intensifying processes of datafication and digitalisation, research is still limited (van der Spuy, 2021). The tools that do exist for evaluating the outcomes or implications of these processes either tend to be applied to assess

the collateral benefits of ICTs or, to potentially negative outcomes in primarily Global North contexts.

In its dominant framing data governance is generally equated with data protection, and data protection with privacy. Within dominant data governance frameworks such as the European Union's General Data Protection Regulation (GDPR) but also those coming from North America and Australia, and more pointedly amongst privacy activists within these regions, it is largely understood as an individual right, and individual challenge. However, there are issues of community and collective rights that may be important to foreground in dealing with issues of public interest and particularly with issues of equality, redress and social justice.

These specific potential risks and harms, which emerge from the realities of digital inequalities, "…challenge both the basis of current data protection regulations and the growing assumption that being visible through the data we emit is part of the contemporary social contract." (Taylor, 2017, p. 1). In other words, data governance may not be enough when viewed from the perspective of Global South data subjects. Linnet Taylor posits that just as an idea of justice is needed in order to establish the rule of law, an idea of data justice – fairness in the way people are made visible, represented and treated as a result of their production of digital data – is necessary to determine ethical paths through a 'datafying' world. She proposes three pillars as the basis of a notion of international data justice relevant to the GPAI's mission of supporting and guiding the development of human-rights based AI: (in)visibility, (dis)engagement with technology, and antidiscrimination that provides a relevant frame for this concept note.

Similarly, data justice requires sound data governance institutions and laws (or frames); but that is not sufficient to ensure data justice, unless they are strongly embedded in a proper understanding of the capabilities and functions that exist within a particular technological, economic and political reality. We need to develop policy and regulation that is able to acknowledge the realities of a citizens' capabilities and functionalities (Sen, 2001), along with the risks that accompany digital developments and lead to the unequal distribution of benefits and harms (van der Spuy, 2021).

8.2 A definition of the project in terms of what we need to know (cutting edge research) or create (an applied AI project)

This section should situate the unique contribution that this project, promoted by GPAI, would make within the wider landscape of initiatives to meet the challenge that you have identified.

Please also indicate your confidence on known international demand: we should have confidence that the project outputs will be used by an identified set of stakeholders (e.g from industry, multilateral institutions, research organisations) at international level.

Within this social economic data justice framing we need to know how privacy, as an essential component of data justice, can be realised in a developmental context which acknowledges both the benefits of visibility, and the risks and hindrances to individualised models for enacting justice mechanisms. We also need to understand how global data flows either entrench or undermine global inequalities. While addressing these global challenges will require global cooperation, we need to insure how proposed global solutions, particularly those drawing exclusively on Global North 'good' practices may entrench or exacerbate global inequalities and result in involuntary incorporation into dominant governance regimes or fora.

For the purposes of focusing the vast area of data and development in relation to AI this project will adopt such a data justice lens through which to look at three areas of inequity and injustice in relation to three proposed research streams - access, datasets and algorithms governance. The research will seek to identify the necessary points of policy intervention or governance in these three interlinked focus areas and the institutional arrangements and measure in resource constrained conditions in order to enable more equitable and just outcomes in relation to AI. The research is premised on the understanding that governance that does not actively redress the uneven outcomes of current processes of digitalisation and datafication will perpetuate the status quo and the dominant interests, power relations and on the recognition of the differential impact of AI on people, communities and countries in terms of harms and as a result the different kinds of risk mitigation for different people, communities and countries.

It is also cognisant of the global nature of much of the data being generated, used (and abused) and the need for global governance of increasingly globalised goods, while respecting national sovereignty and avoiding involuntary incorporation of states that have no say in the systems of governance or which they perceived not to serve their national interests. It is important to acknowledge that data is multifaceted and different kinds of data require different kinds of treatment to achieve the public interest outcomes spoken of above. Although several typologies of data have been developed, the project will start for the purposes of this paper to conceptualise data, based on its non-rival nature, as a common good. It will also explore what data can feasibly be made non-rivalrous or in other ways function as a public goods. This umbrella framing will intersect with the work done across all the other research projects, but will be essential to responding practically to the needs described below.

Access

So, while AI and productive data use could result in real public sustainable development gains, from better efficient government administration, to enhanced service delivery, to improved social and environmental outcomes (Razzano et al., 2020), to do so will require an acknowledgement of the digital inequalities that have so far marked technological developments (Gillwald & Mothobi, 2019). Digitalisation and datafication (particularly in the form of AI) offer both opportunities and risks. But the overlaying of advanced technologies over existing structural inequalities exacerbates these problems. The wicked policy problem here is that of the digital inequality paradox. As more people become connected (or become data subjects without being connected), without very clearly targeted complementary interventions, inequality increases. This paradox exists not only between those connected and unconnected, or data visible or not, but between the minority of people globally able to actively ensure and meaningfully use their access, or defend their visibility, and the vast majority passively consuming minute amounts of data, or unaware of their data subject status, or able to use it to their advantage. The COVID-19 pandemic and associated lockdowns have brought into stark relief the compounding effects of digital and data inequality, as the vast majority of the world's population are unable to digitally substitute their work, schooling, and social security needs. As the UN SG has warned: "two seismic shifts will shape the 21st century - the climate crisis, and digital transformation - both could widen inequalities even further."

Within the context there are two dimensions then to the issue of data access. The first relates to ensuring access to data and the corollary is the protection of personal data when public data is collected or made available. Access to data further has two components. One is to do with asymmetries of information and in enabling access to information about the collection, storage and use of data about an individual or a community. The other is about equalising opportunities of states, communities and individuals to access data

whether for purposes improving public information and planning; or enabling life opportunities and livelihoods whether for commercial, research or innovation. It also relates to the safeguarding of certain information and identities as components of data subject rights, or more generally the rights of both the individual and/or community.

Governance to ensure access in the first instance really speaks to the notion of data as a common or even public good in which the exploration of value from a public policy point of view needs to balance the commercial supply side valuation in the allocation of goods with the demand-side valuation, that recognises the social good of data. The openness paradigm has a number of relevant dimensions for the development context, including openness of public data. It is important in the context of data governance and the equitable realisation of the SDGs, not only to think of people as consumers of data or data subjects, but as producers of data - what kind of data governance is required to reduce the current extreme asymmetries in access and use of data reflecting shifting power relations between global corporations, state and citizens/local firms/start-ups (Razzano et al., 2020)?

But the flip side of open data policies is the second issue raised in relation to governance of access, that of data protection. As indicated this had traditionally been equated with privacy and specifically what is viewed as the overriding right of individual privacy. When considering how to protect privacy in real ways, the first step is to consider the realities of *contextually specific* privacy challenges. There are structural and resource impediments which challenge the 'exercise' of privacy in contexts of constraint. Data protection cannot be fully realised through only ensuring privacy in consumer exchanges, given the role of the public sector and public-private partnerships, but also the remit for collective interest to be weighed against private interests if we are to preserve privacy rights and ensure collective good outcomes.

Further, while of course no single policy can create the perfect enabling environment for all capabilities, it does highlight the need for creating access to recourse (such as through data protection authorities), but also more realistically for exploring mechanisms to ensure data protection more collectively (such as through data trusts or stewardships) (Razzano, 2021). (See also Concept note on Data Trusts, *Workstrand 3: Data trusts for the SDGs:* Identify areas where data trusts could accelerate progress to achieving the SDGs and support pilot projects in these areas.) However, illegitimate surveillance remains a serious threat to democracy and the possibility of equitable societies.

Datasets

As a component of data justice the foundations for privacy are interestingly composed not just of the right to the lawful processing of one's personal data, but also the preservation of one's personal identity and integrity (Burchell, 2009). That personal integrity is an important component of privacy, and brings ideas of just, private data intrinsically to the need for transparency, access and (a form of) control over one's digital identity. And a concomitant part of the need to control aspects of one's identity is the need for access rights, and different forms of transparency. A developmental understanding also helps navigate that 'rights' to a certain condition are not alone the constituents of a just data reality.

Particularly in Africa, a lack of legal identification processes and documents, and resultant invisibility to the state, has left a legacy of development deprivation born of not being 'counted' by the state (Breckenridge, 2014). Yet, the risks and potential harms associated with the rapidly advancing 'datafication of the self' are of increasing concern (Privacy International, 2013). With an increasing focus on free trade agreements requiring

interoperability and cross-border efficacy, the demand for digital inclusion will continue in the region while, concomitantly, extending more people's identities into digital transmutations. This is especially true given the centrality of digital identity to sustainable development agendas (World Bank, 2019) and universal identity standing as a specific SDG goal.

Unprocessed or raw data is often described as having no value. This is arguable. But what is uncontested is that value is generated through data analytics and the holding of, often closed or proprietorial data sets. The control and ownership of data, and the algorithms that derive from and analyse that data is being rapidly determined in global fora according to the dictates of corporations situated in the global North. One example is the process at the World Intellectual Property Organisation which seeks to set global standards for the relationship between intellectual property and AI. While these processes seek to set standards for everyone the concerns of the global South are under-represented due to resource and policy constraints. This aspect of the research will be coordinated with the concept note on copyright, but will look specifically at the application of IP to datasets that constrain the beneficial use of (open) data.

Another aspect of this research will address the problems of invisibility or representivity in data sets whether public or private, open or closed and particularly in relation to the lack of representivity in most large data sets based on data sets gathering predominantly from the Global North and growing data sets from Asia, particularly China that are increasingly being used to service not only commercial but public demand. While open data regimes have been proposed and implemented to overcome these challenges, there are several issues that emerge as a result of opening data to full public accessibility. Jeffrey Alan Johnson (Johnson, 2014) highlights some of the problems related to construction of data often ignored by open data activists: the embedding of social privilege in datasets as the data is constructed: the differential capabilities of data users (especially differences between citizens and "enterprise" users), and the norms that data systems impose through their function as disciplinary systems which could exacerbate rather than alleviate injustices.

Algorithmic governance

The research will focus possibilities for regulation to enable more just and equitable outcomes from algorithmic decision-making which has far-reaching implications for society and which could "...potentially lead to manipulation, biases, censorship, social discrimination, violations of privacy, property rights, and more." This will seek to contextualise this form of governance within, or in relation to, the data governance frames described previously. Algorithmic "personalization and individualization" becomes another process for extracting value and benefit from communities, while splintering opportunities for redress (Mhlambi, 2020). Yet while many of the political and economic dimensions are sourced from similar wicked sources, the research will seek to ensure distinction in the dimensions of resulting risks and harm that may diverge from broader data governance harms and risks, and therefore require different policy interventions (that might be positive and negative).

8.3 An outline of the intended impact of the project long term and outcomes expected by the end of the project

The project is proposed with the aim of influencing the discourse on data governance in relation to AI and commitments to Good, Responsible or Beneficial AI in such a way that acknowledges digital inequalities, to prepare a better foundation for policies, laws and other strategies to advance social justice for sustainable development.

The project is intended to feed into policy debates of global governance of data and AI in regional economic communities and regional blocs and single markets globally but particularly in the global south and enable improved engagement in agenda setting and negotiations on global governance of data directly and indirectly (trade, taxation) and in the realising of data as a social good in national strategies that may contribute to diminishing involuntary incorporation by many states with limited resources into global systems of governance.

8.4 A definition of the more specific outputs, activities and success measures for the project

Outputs:

1. A policy and governance guidelines of principles for data governance based on first, second and third generation rights, possible global and institutional arrangements that are appropriate to the endowments of developing countries and that might practically enable more just AI outcomes.
2. Analyse the feasibility of alternative instruments (data trusts, stewardships) that acknowledge digital inequalities as well as the realities of a citizens' capabilities and functionalities for promoting data and algorithmic justice.
3. Develop a typology of data (including data sets) and associated common harms and differential risks that accompany digital developments and lead to the unequal distribution of benefits and harms,
4. Develop a framework on data access to reduce asymmetries in information between governments and developers in mature economies and in those in less developed economies, between governments and citizens and between global corporations and citizens/firms/start-ups/Global South research institutions. The focus here on access, particularly global platforms and developing country governments for public planning purposes and for commercial operation and start-ups in developing countries (and within developing countries to the public data produced by government and local companies) to realise public goods.