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ABSTRACT

Keywords: artificial intelligence, collaborative governance, data governance, coproduction, Latin America

This paper examines AI projects in the public sector in Latin America to understand the role of citizens and private sector in designing and implementing artificial intelligence projects. Using a comparative case study methodology, the authors focus on the experience of EmpatIA, a program led by the Latin American Open Data Initiative. The paper uses a co-production typology to analyze each case study and provides key insights, including the importance of data quality and standardization, potential for internal process innovation, and knowledge transfer between public, non-profit, and private organizations. These insights provide valuable lessons for developing countries, particularly in Latin America.

Introduction

Artificial Intelligence (AI) applications are expanding in all spheres of society, for commercial, social and environmental purposes. While AI is not a novel field, it is now expanding as several factors play a key role: data is now more readily available and computational power has increased considerably (Smith and Neupane, 2018). Furthermore, a significant group of

companies are now investing in several AI-related technologies in several areas such as health, agriculture, finance, etc.

As AI applications expand, governments face two issues: regulating the algorithms and governing by algorithms. Regulation of algorithms has led to ethical guidelines (e.g. UNESCO ethical principles on AI) and emergent regulation (e.g. the proposed European Union AI Act) trying to develop frameworks for the use and development of these techniques. As regulation advances so does the use of algorithms by governments in day-to-day activities such as handling migration, job-seeking applications programs or education (Kuziemski and Mizuraka, 2020). These techniques allow governments to analyse and process data faster for their day-to-day tasks. As these uses spread, so does the potential of misuse and eventual harm (Ehsan et al, 2022) as is increasingly documented. Therefore, in this paper, we ask, what is the role of stakeholders such as citizens and the private sector in designing and implementing artificial intelligence projects in the public sector?

We focus on the implementation of AI projects in the public sector in Latin America to understand how multiple stakeholders can work together in an equal partnership to create ethical applications of AI. Looking at the Latin American context allows us to explore AI-enabled innovation in a diverse and unequal (Scrollini, Cervantes & Mariscal, 2021) setting. We draw from the literature on data governance to think through other collaborative processes that involve data sharing among multiple stakeholders. Specifically, we conceptualise co-production as an umbrella concept that captures a wide variety of activities that can occur across various phases in the public service cycle and in which various state and lay actors can work together to produce benefits (Nabatchi et al, 769).

In this paper, using co-production as an analytical tool allows us to consider how the expertise inside and outside the public sector can be brought together to create artificial intelligence projects in Latin America. Empirically, we focus on the experience of EmpatIA, a program led by the Latin American Open Data Initiative (ILDA) with technical support from Centro Latam Digital (CLD) and financial support from the International Development Research Centre (IDRC) and the Inter-American Development Bank (IADB).

We find that in Latin America, artificial intelligence policies and strategies are rare. A few countries have AI strategies in place and are being executed while others have isolated initiatives or AI is not a priority at all (Scrollini et al, 2021; Prudencio, 2021). Therefore there is an

opportunity to explore a degree of different methodological approaches that could serve the development of the region as it advances in its paths to the adoption of AI in the public sector. Moreover, our research finds that co-production in the field of artificial intelligence can occur at any level of co-production and phase of the service cycle, however, most of the case studies we analysed were successful in the co-delivery of services. Conceptually, we contribute to the literature of collaborative governance by empirically analysing the 3 x 4 co-production typology presented by Nabatchi et al (2017) with seven case studies of the co-production of seven artificial intelligence for public good projects in Latin America.

This paper is organised as follows; first, we discuss what we mean by co-production in artificial intelligence projects. Then, we go over the methodology and research setting, focusing on the comparative case study methodology, followed by an examination of the seven case studies we explore in this paper. Lastly, we discuss the lessons learned in the implementation of EmpatIA in Latin America.

2. AI in the public sector and co-production

AI can refer to a vast array of issues (Wirtz et al, 2018) including systems that think like humans, systems that act like humans, systems that think rationally or systems that act rationally (Russell and Norvig 2010). Current AI projects can be different types of technologies such as image recognition, pattern recognition, natural language processing, robotic process automation and robotics. In the context of governments, Misuraca et al (2019) suggest that AI can derive benefits as follows:

> AI-enabled innovation within governments can support redesigning governance processes and policy-making mechanisms, as well as improve public services delivery and engagement with citizens is growing. When used responsibly, the combination of new, large data sources with advanced machine learning algorithms could radically improve the operating methods of the public sector, thus paving the way to proactive public service delivery models and relieving resource-constrained organisations from mundane and repetitive tasks. (Misuraca et al, 2019, pg 6).

In the context of this research we mostly refer to AI as machine learning tools able to analyse, cluster, automate and eventually predict activities or outputs (Smith & Neupane 2018).

2.1 Defining co-production in AI projects in the public sector

Co-production is a term first coined by Elinor Ostrom (Ostrom et al, 1978) who defined it as 'the process through which inputs used to produce a good or service are contributed by individuals who are not in the same organisation. Whitaker (1980) identifies three activities as co-production: 1) citizens requesting assistance from public agents; 2) citizens providing assistance to public agents; and 3) citizens and agents interacting to adjust each other's service expectations and actions. In a more contemporary definition, authors such as Howlett, Kekez & Poocharoen (2017) identify that the meaning has evolved in recent years to include both individuals (i.e. citizens and quasi-professionals) and organisations (citizen groups, associations, and non-profit organisations) collaborating with government agencies in both the design and management of services as well as their delivery. Thus, Howlett et al (2017) argue that co-production has become both a managerial device that enriches the provision of public or private service and a set of policy tools. Nabatchi, Sancino and Sicilia (2017) define co-production as "an umbrella concept that captures a wide variety of activities that can occur in any phase of the public service cycle and in which state actors and lay actors work together to produce benefits" (Nabatchi et al, 769). We follow this umbrella definition throughout the paper and analyse co-production activities specifically related to artificial intelligence projects in the public sector.

Additionally, we follow Nabatchi et al (2017) typology of co-production which places co-production projects in a 3 x 4 matrix by the level of co-production (individual, group, collective) and phases of the service cycle. The phases of the service cycle are defined as follows: 1) co-commissioning refers to activities aimed at strategically identifying and prioritising needed public services, outcomes, and users, 2) co-design refers to activities that incorporate the experience of users and their communities into the creation, planning, or arrangements of public services, 3) co-delivery refers to joint activities between state and lay actors that are used to directly provide public services and/or to improve the provision of public services and 4) co-assessment focuses on monitoring and evaluating public services.

As Wu et al (2021) argue, there is a need for collaboration between public and private actors as the growth of the digital economy has transformed private actors into a major source of data, rather than the government being the main producer of data. Using co-production as an analytical

tool allows us to think beyond the production of data, which while necessary, is just one step in the creation of artificial intelligence projects.

3. Research setting and methodology

EmpatIA had the objective of contributing towards the creation of an inclusive, ethically-grounded and rights-based AI field in Latin America. The main objectives of the program are: 1) promoting a better understanding of how the public sector should develop AI policies for development, considering ethical, political, social and economic aspects, 2) promoting the capacities of decision-makers in the design and application of AI and 3) promoting projects that explore the resolution of public problems through the use of AI in the public sector. One of the components of the project had the objective of supporting AI government projects with knowledge and evidence to achieve inclusive AI solutions to replicate and scale across the region. This component involved making a regional call for proposals to select current AI initiatives that can be supported through our work and studied to identify strengths and weaknesses from the socio-economic perspective

Understanding the EmpatIA program as co-production in AI for the public good, provides opportunities for different sectors to share technical and thematic knowledge that requires collaboration among two or more parties. EmpatIA created synergies for cooperation between public and private enterprises, with the explicit objective of creating AI tools that can contribute to a variety of social issues such as climate change, transparency and accountability, and health and water management. The co-production aspect of this program is most neatly defined in the regional call for proposals. We did an open call for applications in the summer of 2020, where we received more than 70 proposals that were reviewed by an expert panel. Of these proposals, 41% came from the private sector, 39% from civil society organisations, 11% from academia and 10% from governments. Of the 74 proposals received, 35 proposals were related to Covid-19 emergency management, followed by 26 on democratic institutionality and government transparency, 6 on climate change, 4 on natural resource management, 3 on gender issues and 3 on other issues.

The theory of change of EmpatIA was built on the idea that there is a challenge in terms of understanding how to harness AI in Latin America without the proper policies and design

practices. We identify that this challenge requires a strengthening of open data initiatives that ensure the availability and accessibility of data, as well as increased governmental awareness of potential uses of AI for development.

After the evaluation round, seven projects were selected by the jury to participate in EmpatIA. The selected projects comprise a wide range of subjects including open justice, climate change and mitigation, publicization of contracting data and official governmental newspapers and early identification of cardiovascular diseases. We understand EmpatIA as a co-production project because it allows for-profit or non-profit organisations, to collaborate with government agencies in both the design and management of services as well as the delivery of services.

In this paper, we compare individual case studies of projects that participated in the EmpatIA program. We have been involved in the EmpatIA program since its conception, which gave us privileged access to the project proposals, initial interviews, social impact slide decks, community calls both internal and external, as well as financial and narrative progress reports throughout the implementation of each case study, and semi-structured interviews with each of the seven selected teams. The financial and narrative reports allowed us to measure and evaluate the objectives, budget, reported activities, deliverables and reflections on the implementation of the projects. The semi-structured interviews had five main themes: project implementation experiences and challenges, contributions to their organisational structure, project scope, sustainability and continuity of the project and evaluation of the project implementation. Table 1 shows a summary of the multiple data sources used for each case study.

Table 1 Multiple data sources across cases

Interviews	7 semi-structured interviews with each team (average duration 60 minutes)
Other secondary data	Project proposals (7, average of 10 pages each) Social impact slide decks (presented by each project to the selection committee) Financial reports Narrative reports

	Community calls (Internal) Community calls (Public)

4. Artificial Intelligence for Development: 7 cases in Latin America

In this section, we use a comparative case studies methodology to identify where the EmpatIA projects fit in the Nabatchi et al (2017) 3 x 4 typology of co-production. This typology considers two main variables. Firstly, the levels of co-production: individual, group or collective. The second variable is the phase of the service cycle: co-commissioning, co-design, co-delivery and co-assessment.

While EmpatIA is a single program, it allows us to explore seven case studies and build on the multiple data sources described above to provide an understanding of the co-production of artificial intelligence projects for the public good in Latin America. The projects that participated in EmpatIA were created to contribute to the public good in several thematic areas such as public procurement, health, environment, resource management and democratic participation. Table 2 presents a summary of all the participating projects, including their country, objectives, partners, beneficiaries and type of AI tool implemented.

Table 2: Summary of EmpatIA co-production projects

Name of project	**Country**	**Objectives**	**Partners**	**Main beneficiaries (Direct + Indirect)**	**AI Tool**
Control Cívico	Paraguay	Increase citizen participation in the control and monitoring of the public procurement	Centre of Sustainable Development, National Directorate of Public	Direct: National Directorate of Public Procurement of Paraguay and National Public	Training model, an ETL (Extract, Transform, and Load) process for data

		process by bringing data closer to citizens through a Twitter bot.	Procurement of Paraguay and National Public Procurement Agency of Colombia.	Procurement Agency of Colombia. Indirect: journalists and the technical community interested in the data.	extraction updated automatically and executed on a server and the Twitter bots.
IA²	Argentina	Accompany and guarantee the anonymization process of legal resolutions in Spanish	Cambá Cooperative, Buenos Aires Judicial Power District 10	Direct: Juzgado n° 10 de la Ciudad de Buenos Aires Indirect: Poder Judicial Costa Rica, Poder Judicial Nuevo León (Mexico), Residents of Buenos Aires	Develop user interface, implementing data extraction, developing the model in relation to the server, training the model and developing and improving the infrastructure for model training.
	Chile	Predict the level of air quality and the occurrence of critical	Goblab UAI, Chile's Environment Superintendency (SMA)	Direct: SMA Indirect: Citizens of Chile	Build regression and classification models, consolidate data

		episodes, based on emission data from polluting industries, air quality stations and meteorological data from the communes of Concón, Quintero and Puchuncaví.			with new sources and explore predictive models with a new database to create a deep learning model
ProsperIA	Mexico	Prevention and widespread early diagnosis of chronic diseases (Diabetes mellitus, hypertension and cardiovascular diseases)	Mexican Diabetes Federation, Hospital de Nutrición de México and the Institute of Public Health Citizenship	Direct: Mexican Diabetes Federation, Hospital de Nutrición de México and the Institute of Public Health Citizenship Indirect: 220 million people in Latin America and the Caribbean at risk of	Adjusted the risk models, evaluated the models in specific subpopulations, created adaptive questionnaires hosted on web platforms and are constantly monitoring the use of risk calculators

				developing lethal and disabling complications from chronic diseases.	
Querido Diario	Brazil	Centralise the content of the official gazette of Brazilian municipalities to facilitate citizens' access to public information usually published by individual municipalities.	Open Knowledge Foundation, Institute of Mathematics and Statistics; Jurema and Digital Ocean	Direct: 2,226 Brazilian municipalities Indirect: All Brazilian municipalities, citizens of Brazil,	Classify, contextualise and expand the information contained in Brazilian official municipal newspapers
CONAE	Argentina	Using satellite information to create prediction models to estimate pollution levels in Argentina, to create maps of the daily and	CONICET postdoctoral researchers	Direct: National Commission for Space Activities (CONAE), the "Mario Gulich" Institute for Advanced Space Studies (IG, CONAE/UNC)	Automate the download and preprocessing of the satellite products, and automate map processing and publishing of PM10 in interoperable

		monthly surface concentration of the pollutant PM10		and the Argentine Ministry of Environment and Sustainable Development (MAyDS). Indirect: Citizens of Argentina	formats.
Dinagua	Uruguay	Improving the control and administration of the country's water resources,	Agência Nacional de Águas e Saneamento (ANA)	Direct: DINAGUA Indirect: Citizens of Uruguay	Computer vision, allowing the automation of the detection of direct extraction intakes from water bodies through the analysis of aerial images

Understanding the geographical location, main objectives, partners, beneficiaries and type of AI tool implemented allows us to place each project in the 3 x 4 co-production typology created by Nabatchi et al (2017). Our goal is to identify and examine the differences among each project using two main variables: level of co-production and phase of the service cycle. Having this classification allows us to examine the factors and the usefulness of co-production techniques in artificial intelligence projects designed for the public good, by evaluating each project according

to the classification in the typology and the reported outcomes in their financial and narrative progress reports, as well as the community calls. Table 2 shows where each project fits into the 3x 4 co-production typology.

Table 3 - Nabatchi et al's (2017)3 x 4 co-production typology

Phase of the Service Cycle				
Level of co production	**Co-Commissioning**	**Co-Design**	**Co-Delivery**	**Co-Assessment**
Individual	**Dinagua** Dinagua worked with external consultants to create a tool that identifies water intakes in Uruguay, to improve their public water management		**ProsperIA** ProsperIA 's risk calculators are based on publicly available data from the National Health Institute and are partnering with Health Institutions to promote the use of the risk calculators	**Control Cívico** By automating the data publication, Control Cívico facilitates the assessment of public procurement in Colombia and Paraguay
Group	**CONAE** CONAE worked with doctoral students from CONICET, the Institute for Advanced Space Studies and the Argentine Ministry of Environment and Sustainable to design	**Goblab UAI + SMA** The two teams worked together to produce the regression and classification models that predict the	**IA²** Contributes to the ongoing activities of the Juzgado n° 10, making them faster and requires active engagement of the Juzgado n° 10 team, to get	

	the algorithms to map the daily concentration of PM10 pollutant in Argentina	concentration of the pollutants in Chile	access to the documents and data needed	
Collective			**Querido Diario** This project scrapes data from official gazettes and publishes them in more accessible formats, which benefits the municipalities	

After examining where each project fits into the 3 x 4 typology in Table 3, we discuss the outcomes of each project organised by the phase of the service cycle in which they were created.

To begin, we classified the projects according to the level of co-production, for which Nabatchi et al (2017) propose the individual, group, and collective categories. They define individual coproduction, as a state actor and a lay actor working directly with each other. At this level, we identify the work of Dinagua, ProsperIA and Control Cívico. In this case, Dinagua is the only state actor leading the project, but the lay actors that they work with were consultants hired to bring technical skills to the organisation. ProsperIA works with the Ministry of Health and Control Cívico works with the National Procurement Agencies of Colombia and Paraguay.

Nabatchi et al (2017) define group co-production as one or more state actors working directly and simultaneously with a specific cluster or category of lay actors who share common characteristics or interests. We identified that the CONAE, Goblab UAI + SMA and IA² projects fit in this category, as they are all co-led by state actors (CONAE, SMA and the District 10th court) that collaborate with a cluster of lay actors. CONAE works with a variety of other state and specialised lay actors, the SMA collaborates with the think-tank Goblab and collaborates

with other academic and state actors and the IA² project worked with a cluster of other co-ops in Argentina.

Lastly, for collective co-production, one or more state actors work directly and simultaneously with several lay actors to address one or more related issues. The only project that fits this category is the Querido Diario project which works with several municipalities simultaneously as well as an expanded network of lay actor volunteers.

First, the co-commissioning projects: Dinagua and CONAE. Co-commissioning projects were the most disconnected from the general public, and they required high levels of thematic expertise in water and environmental management. In the case of Dinagua, we argue that this was an individual project, led exclusively by Dinagua and it became a co-production project only when they hired an external consultant to contribute to their operations, particularly for the implementation of AI tools. In the case of CONAE, their collaboration with other groups that have similar thematic expertise facilitated the use of satellite information to map the daily concentration of the PM10 pollutant in Argentina.

The second phase of service delivery, the co-design project is an in-between point between co-commissioning and co-delivery. Here we identify the project led by the GobLabUAI + SMA, it is similar to the Dinagua and CONAE projects in terms of requiring high levels of thematic expertise in environmental management, however, co-producing with the GobLabUAI allowed the SMA, who already had to work on these models to improve their day to day activities, to incorporate new technologies and agile methodologies that they otherwise would not be using. This allowed both teams to consider the needs of the users, including the SMA, in the regression and classification models created in the project. This allowed the SMA to comply with their mandate and made the information more easily accessible to users in the general public.

The third phase of co-production was the most commonly represented by the participating projects: co-delivery, although the level of co-production did alter the outcomes of the projects significantly. First, at the individual level, ProsperIA. This project had the least amount of interaction with partners in the initial phases of the project. Initially, ProsperIA only used publicly available data from public institutions such as the National Nutrition and Health survey. Once they created the risk calculators and created adaptive questionnaires hosted on a web platform, they started seeking collaboration opportunities with Mexican Health Institutions such

as the Mexican Diabetes Federation, Hospital de Nutrición de México and the Institute of Public Health Citizenship to promote the use and recommendation of the services created by Prosperia. They had enough thematic and technical expertise to carry out the project by themselves, but they need collaboration with public institutions that have day-to-day access to the population Prosperia's project is trying to serve.

On the group level of co-production in the co-delivery phase, we find the IA² project. This was envisioned as an active collaboration with the Court n° 10 of the City of Buenos Aires, and it required the active engagement of Cambá with the Juzgado n° 10 team, to get access to documents and data they needed to create the tool. These projects needed thematic expertise that was provided by the Court n° 10 of the City of Buenos Aires and technical expertise provided by Cambá Cooperative. The result of the collaboration was the improvement of the public services provided by the Court n° 10 of the City of Buenos Aires to their users and the general public. Lastly, in this category, we find the Querido Diario project. This project was initiated with little contact with public institutions and interacted mostly with the publicly available information from the official gazette. However, they collaborated with a wide variety of institutions including academia and other civil society organisations to create the project, interestingly the Open Knowledge Foundation also works with volunteers that provided technical expertise in the development of the open-source AI tool they created. Once they had the tools in place and were able to scrape the data, OKFN reports that some municipalities reached out to them to use their tools to improve the quality of their municipal gazettes.

Lastly, the co-assessment phase of the service cycle was only represented in one of the projects: Control Cívico. In this project, CDS created a Twitter bot based on the data published by the National Directorate of Public Procurement (DNCP) of Paraguay and the National Public Procurement Agency of Colombia. CDS has contributed over time to the Open Contracting Data Standard publication of both of these entities, and reports to have a very close working relationship with the DNCP and a good working relationship with Colombia. In this case, CDS has the technical expertise and thematic expertise they have built over years of collaboration with both entities, which allows them to position themselves as unique experts that can contribute to the evaluation of public procurement in Colombia and Paraguay, from publication to red flag monitoring.

5. Co-production Projects in Latin America: Lessons learned

The first lesson learned is that data is an essential component of artificial intelligence co-production projects. Scrollini, Cervantes & Mariscal (2021) identify that all projects participating in EmpatIA use public data that relies on the state's data infrastructure. Data infrastructure is the technical means, services and facilities used where data is produced, maintained and distributed.

Ensuring the quality of data infrastructures requires a significant investment of time and effort. For example, to follow the same data standard and the constant publication and revision of the same. Given that the state is the biggest producer of public data, most co-production projects for artificial intelligence will have a dependency on state actors. If these infrastructures are not of good quality, projects related to the public sector are likely to fail.

In the case of CONAE, Dinagua and the GoblabUAI-SMA project, the project leaders were also the people in charge of maintaining the data infrastructures, which allowed them to have greater control over the production, maintenance and distribution of that data. However, this requires more investment of time, money and trained personnel, and often the quality of data infrastructures depends on maintaining the institutional memory of previous governments. This characteristic made the projects fit into the passive, individual and compliant characteristics of Bussu & Galanti's (2018) co-production typology. In these three examples, it was possible to observe different success levels in the implementation of the projects, directly related to the ability of state actors to access high-quality, standardised data, which they had to produce or at least collect themselves. Dinagua reports that after the implementation of the project, they have rewritten the data collection guidelines to ensure that future data collection is easier, by standardising procedures such as the colour and size of the water intakes.

One of the main findings is the role of data standardisation in the success of projects, specifically those led by the private sector with public data, such as Control Cívico (CDS) and ProsperIA. These projects had the least interaction with the state, although they relied on the state's previous and continuous efforts of data collection and open data access. Throughout the process we found that projects that were familiar with the required data infrastructures had a significant advantage over other projects, allowing them to move faster by being able to reuse good quality public data. This was mainly the case for projects led by the private sector, which created their products

based on data that had a good infrastructure over time, often in collaboration with the agencies that are in charge of them.

The next lesson learned is that co-production initiatives have the potential to contribute to innovation in the internal processes of organisations, particularly for state actors. Jaspers and Steen (2020) argue that capacity building for sustained co-production includes institutionalising processes. According to their view, this extends beyond the provision of regulative frameworks supportive of co-production and includes the structural allocation of required resources. While formal regulations might take a long time to change, the teams reported that they have incorporated new ways of working into their regular processes after implementing their co-production projects. For example, Gob Lab and SMA's leaders told us that how academia works are very different from the SMA's processes, but their work together made both teams improve their processes.For example, in terms of documentation and open access to the code, the Goblab team mentioned that they have a policy to document everything on Github, a policy the SMA did not have in place. After their collaboration, the SMA usually does not work with public-facing documentation or code, but this experience showcased the value of doing so.

In several of the case studies, institutions had to hire outside consultants which brought external knowledge to the organisation. According to Steen & Bransen (2020), the contribution of professionals and citizen co-producers should be complementary rather than merely substitutive. Hiring external consultants is a short-term solution that is chosen to solve a lack of internal expertise, which limits the ability of co-production projects to avoid being

The fourth lesson is that in the face of a lack of innovation in the public sector, co-production projects that use public data and only have a transactional relationship with the state, and this makes them less likely to become long term or permanent collaborations. However, co-production seems to be an adequate solution to the lack of technical expertise in artificial intelligence in the public sector, and the inability of the public sector to compete with the market value of technology experts as it currently stands. The risk of outsourcing innovative projects after the initial co-production initiatives is that there is a reduced likelihood of long-term implementation of these projects, as they would require constant streams of external funding, which often relies on the availability of grants and funds from international organisations.

6. Concluding remarks

Using 7 cases of AI implementation in Latin American governments, we find three main contributions of co-production techniques to artificial intelligence for public good projects. First, when AI projects are designed as co-production cases, there is a transfer of technical skills from the private sector and civil society to the public sector that benefit society as a whole. Driving AI projects from the government would be otherwise too costly and unsustainable without established mechanisms in which state actors can work together with third-party actors to produce benefits for the public good. Second, using a co-production lens, our research finds that partnerships are diverse and to some degree unique and could involve small firms, cooperatives, or civil society organisations according to the peculiarities of the context and objectives. This finding is very important, as it does suggest that AI is not the exclusive realm of big firms; co-production mechanisms could help to diversify a highly concentrated market. Third, in line with the previous finding, the public sector contributes back to their co-production partners with thematic expertise and access to public data that private entities would otherwise not have on their own. And lastly, the framing of co-production projects as "projects for the public good" by funding entities contributes to incorporating the logic of openness, particularly in using open source and open data, that individual actors, public or private, might not use otherwise. In this way, AI tools can be developed in a transparent, verifiable and potentially scalable way.

References

1. Bussu, S., & Tullia Galanti, M. (2018). Facilitating coproduction: the role of leadership in coproduction initiatives in the UK. *Policy and Society*, *37*(3), 347-367.
2. European Commission. (2021) The Artificial Intelligence Act. https://artificialintelligenceact.eu/the-act/
3. Ehsan, U., Singh, R., Metcalf, J., & Riedl, M. (2022, June). The Algorithmic Imprint. In 2022 ACM Conference on Fairness, Accountability, and Transparency (pp. 1305-1317).
4. Howlett, M., Kekez, A., & Poocharoen, O. O. (2017). Understanding co-production as a policy tool: Integrating new public governance and comparative policy theory. Journal of Comparative Policy Analysis: Research and Practice, 19(5), 487-501.
5. Jaspers, S., & Steen, T. (2019). The sustainability of outcomes in temporary co-production. *International Journal of Public Sector Management*.

6. Kang, S., & Van Ryzin, G. G. (2019). Coproduction and trust in government: evidence from survey experiments. Public Management Review, 21(11), 1646-1664.
7. Karliuk, M. (2020). Working Document: Toward a Draft Text of a Recommendation on the Ethics of Artificial Intelligence. UNESCO.
8. Kuziemski, M., & Misuraca, G. (2020). AI governance in the public sector: Three tales from the frontiers of automated decision-making in democratic settings. TelecommunicationPolicycy, 44(6), 101976.
9. Mergel, I. (2015). Opening government: Designing open innovation processes to collaborate with external problem solvers. *social science computer review*, *33*(5), 599-612.
10. Misuraca, G., van Noordt, C., & Boukli, A. (2020, September). The use of AI in public services: results from a preliminary mapping across the EU. In *Proceedings of the 13th International Conference on Theory and Practice of Electronic Governance* (pp. 90-99).
11. Nabatchi, T., Sancino, A., & Sicilia, M. (2017). Varieties of participation in public services: The who, when, and what of coproduction. Public Administration Review, 77(5), 766-776.
12. Ostrom, E., Parks, R. B., Whitaker, G. P., & Percy, S. L. (1978). The public service production process: a framework for analyzing police services. Policy Studies Journal, 7, 381.
13. Prudencio, K. (2021) Estrategias de Inteligencia Artificial en América Latina. ILDA.
14. Smith, M., & Neupane, S. (2018). Artificial intelligence and human development: toward a research agenda.
15. Scrollini, F, Cervantes, M & Mariscal, J (2021). En busca de rumbo: el estado de las políticas de inteligencia artificial en América Latina. ILDA.
16. Scrollini, F. (2020). Automatizar con cautela: Datos e Inteligencia Artificial en América Latina. ILDA. https://doi.org/10.5281/zenodo.4564556
17. Steen, T., & Brandsen, T. (2020). Coproduction during and after the COVID-19 pandemic: will it last? *Public Administration Review*, *80*(5), 851-855.
18. Whitaker, G. P. (1980). Coproduction: Citizen participation in service delivery. Public administration review, 240-246.

19. Wu, D., Verhulst, S., Pentland, A., Avila, T., Finch, K., & Gupta, A. (2021). How data governance technologies can democratize data sharing for community well-being. *Data & Policy*, *3*.