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Co-producing AI: A guide for making AI work for the public good

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This research was developed with the support of the Banco Interamericano de Desarrollo (BID) and the International Development Research Centre (IDRC).

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Introduction

In 2020, ILDA began to work on the Empatía project to help create an inclusive, ethically-grounded and rights-based artificial intelligence (AI) field in Latin America. The program's objective is to gain understanding of the region's existing public policies concerning AI. When we use the term "AI" in the context of this report, we mostly refer to the use of machine learning techniques to analyze or cluster data or to automate processes. Most of the projects we reviewed used public data (i.e., data that is to some degree open) as their source material.

We also sought to understand how these policies can be improved to benefit all the stakeholders involved, as well as to understand their ethical, political, social and economic aspects. Additionally, we sought to gather evidence "by doing" in order to generate practical knowledge that could help inform policy design.

Empatía selected 7 co-production projects in Latin America with the aim of helping to create a nascent community of AI public sector practitioners. Empatía was led by the Latin American Open Data Initiative (ILDA) in partnership with Centro Latam Digital (CLD) and with f inancial support from the International Development Research Centre (IDRC) and the Inter-American Development Bank (IADB).

We define "co-production projects" as a set of activities in which governments and civil society organizations, small businesses, and citizens collaborate to create, reshape or improve public services.[1] A co-production approach offers a way to understand how different stakeholders can cooperate to shape AI for the public good. In the current context AI is an experimental tool with limited application in the public sector. To create this co-production guide, we used the following primary and secondary sources to identify the common steps used by the participating teams: 7 semi-structured interviews, 7 project proposals, 7 social impact slide decks, 14 financial reports, 14 narrative reports, and 6 community call transcripts.

The road towards a co-production guide for AI projects

Empatía created synergies for cooperation between the public, civil society organizations, academics and private enterprises, with the explicit objective of creating AI tools that can aid in solving a variety of social issues such as climate change, transparency and accountability, health and water management. The open call for applications launched in the summer of 2020 and yielded 74 proposals. Of these, 41% came from the private sector, 39% from civil society organizations, 11% from academia and 10% from governments. Of the 74 proposals received, 35 were related to COVID-19 emergency management, followed by 26 on democratic institutions and government transparency, 6 on climate change, 4 on natural resource management, 3 on gender

1 In this report, we follow Nabatchi, Sancino and Sicilia (2017) define co-production as 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). In the same line, Howlett, Kekez & Poocharoen (2017) identify that co-production refers to the collaboration among individuals (i.e. citizens and quasi-professionals) and organizations (citizen groups, associations, non-profit organizations) collaborating with government agencies in both the design and management of services as well as their delivery. The term co-production is useful as a managerial device that enriches provision of public or private service and as a set of policy tools.

issues and 3 about other issues.

After the evaluation round, 7 projects (Table 1) were selected by the jury to participate in Empatía. The selected projects comprise a wide range of subjects including: open justice, climate change and mitigation, publication of contracting data, official governmental newspapers and early identification of cardiovascular diseases.

Table 1: Empatía Projects

Name of project	Country	Objectives
Control Cívico	Paraguay	Increase citizen participation in the control and monitoring of the public procurement process by bringing data closer to citizens through a Twitter bot.
IA2	Argentina	Accompany and guarantee the anonymization process of legal resolutions in Spanish.
Gob Lab + SMA	Chile	Predict the level of air quality and the occurrence of critical episodes, based on emission data from polluting industries, air quality stations and meteorological data from the communes of Concón, Quintero and Puchuncaví.
ProsperIA	Mexico	Prevention and widespread early diagnosis of chronic diseases (Diabetes mellitus, hypertension and cardiovascular diseases).
Querido Diario	Brazil	Centralize the content of the official gazette of Brazilian municipalities to facilitate citizens' access to public information usually published by individual municipalities.
CONAE	Argentina	Using satellite information to create prediction models to estimate pollution levels in Argentina, in order to create maps of the daily and monthly surface concentration of the pollutant PM10
Dinagua	Uruguay	Improve the control and administration of the country's water resources.

Cycle of co-production of AI projects

We have identified 8 basic steps to implement AI projects for the public good using co-production as a framework. This guide is meant for teams that want to implement collaborative AI projects for the public good, which can be led by the public or private sector. This guide aims to present a clear collaborative strategy for such projects. The following steps are described below and explored in further detail in this document:

Figure 1: Eight steps in the cycle of co-production of AI projects

1. Identify the problem
2. Identify the relevant stakeholders
3. Look at the data
4. Find technical experts to implement your vision
5. Develop and test the tool prototype using agile methodologies
6. Develop the tool
7. Use the tool and engage with relevant stakeholders
8. Ask different stakeholders to evaluate the usefulness of the tool

1. Identify the problem

The first step is identifying the problem to which the tool can contribute. To do this, teams should answer the following question: Why does this tool matter?

Asking this question allows teams to reflect on the environment in which the tool will be implemented, the existence of other tools that have tried to solve the same problem, as well as how their tool will differ from other existing tools. Additionally, reflecting on the problem the tool is trying to solve allows teams to recognize that social problems likely will not be solved by a single tool. Using this step as a critical exercise allows teams to identify AI's strengths and limitations with respect to a given public problem, rather than falling into the trap of techno-solutionism[2].

Understanding the cause of a given problem is important. There are multiple ways one can use machine learning technologies to address social issues, but it is useful to start by providing a well-reasoned justification for why a particular technology is needed. We suggest iteratively asking the question "**Why does this tool matter?"** to understand the root of the problem and the role an AI tool can play in addressing it. The box below provides an example of how to use this question, based on the IA2 project in Argentina, a co-production between Cambá Cooperative and the Juzgado n° 10 of

2 Morozov (2013) defines "technological solutionism" as an ideology that recasts complex social phenomena like politics, public health, education, and law enforcement as "neatly defined problems with definite, computable solutions or as transparent and self-evident processes that can be easily optimized—if only the right algorithms are in place!"

Buenos Aires.

Figure 2: Why does this tool matter?

[3]The problem is that we have limited transparency in judicial records due to lack of means to publish them adequately according to legal and technical standards.

Why does this tool matter?
Without an adequate tool and structured data we lack the means of publishing hundreds of judicial decisions properly, according to legal and human rights standards.

Why does this tool matter?
If these decisions are not made publicly available, citizens and judicial actors are not able to understand how the judiciary works, who makes the decisions and the nature of the decisions.

Why does this tool matter?
Without a transparent and efficient judiciary, citizens lose trust in it, jeopardizing the role of a basic institution.

2. Identify the relevant stakeholders

The second step is to identify the relevant stakeholders involved in the environment in which the tool will be implemented. It is important to consider that relevant stakeholders are experts in the problem you are trying to solve and in the possible solutions. A co-production framework allows teams to pair technical expertise in AI with field-specific knowledge of the public sector's inner workings. Since co-production projects can be initiated by teams in either the public or private sector, it is important to properly understand the objectives and needs of the partners involved. Success derives from collaboration among all the involved parties.

Here, we identify two main paths that can be taken:

The first is when a collaboration between teams in the public and private sector is already in place. This path is more straightforward as there is no need to search for a collaborator; however, it is still necessary to implement several strategies to ensure the collaboration is successful. For example, the partnership can be between longstanding collaborators, as was the case in the co-production process of Cambá Cooperative and the Juzgado n° 10 of Buenos Aires. Working with a long-term collaborator can ensure that the goals of both can be taken into account. Additionally, less learning is required because the teams are already familiar with each others' work style, capacity, and abilities.

A second approach to longstanding partnerships entails crowdsourcing help from individual collaborators, as in the case of the Querido Diario project. Open Knowledge Foundation (OKFN) Brazil has consistently collaborated with a group of volunteers in

3 Based on "Develop a set of realistic, stakeholder-focused outcomes from ODI

their projects. The collaboration happens in different ways, from coding lines on Github to crowdfunding efforts. Having multiple collaborators reduces the workload of the main implementers, and allows people with different expertise and availability to participate in projects for the public good.

The second path entails individual teams seeking external collaborators after developing an idea. This can be done by teams in the public or the private sector that have an idea of how to solve a public problem, but lack the technical or thematic expertise to implement it. In this case, teams can solicit collaborators among their networks. Even if the potential partner is not in your immediate circle, having others share your open call can yield interesting partnerships.

To identify the best approach to collaboration, for creating, implementing and even monitoring the tool, team members should consider asking themselves the following:

Figure 3: Stakeholder questions[4]

1 .Who are the stakeholders?
List all possible stakeholders, from government officials to potential technology providers, and map them.

2. Who are the most interested stakeholders?
Define interest and importance in a way that makes sense for the project. For instance, a minister can be an important stakeholder in that s/he could give a green light to the project, but more interested stakeholders could be the people in charge of managing the project or the data.

3.Who are the stakeholders most aligned with your objectives?
Some stakeholders will be aligned with the goals of your project and others will not be. Gaining a good sense of the alignment of objectives is important to identify the levels of support for the project as well as opposition or resistance to it.

These partnerships can be formalized or more casual, depending on the nature of the relationship. A good example of this flexibility is the ProsperIA project. While the project was designed and implemented exclusively by ProsperIA, they used data from the National Survey of Health and Nutrition (ENSANUT) to build their risk calculators, and they also partnered with different health institutions, diabetes clinics, pharmacies, clinical laboratories and telemedicine providers to promote the use of the tool. ProsperIA is a good example of the process of evaluating and understanding the role of many stakeholders despite not being in a strong partnership with them. This demonstrates that, while an organization may have the necessary technical and thematic knowledge, it needs to collaborate with the stakeholders involved in solving the issue in everyday life, because without proper stakeholder engagement, the product likely will receive little use.

4 Based on “Develop a set of realistic, stakeholder-focused outcomes from ODI

A good way to understand whether a partnership is viable is to think about an organization's capacity and willingness to participate in a project. This framework is particularly useful for understanding a public sector entity's capacity and willingness to collaborate on co-production projects. Although, in some of the Empatía cases, the public sector entity was the main stakeholder and leader of the project.

- Capacity is the ability to understand and manage a project, manage several technical aspects of data and sustain the project over a certain period of time. This combination of factors helps to determine whether co-production is possible. The ideal situation would be to collaborate with a partner that is willing and capable. If partners are willing to collaborate but have low capacity, they can combine resources and expertise and negotiate time availability, political willingness and access to resources in order to solve a specific public problem.
- Willingness is the degree to which government officials are motivated to advance a solution. This could be indicated in several ways, such as by letters from relevant authorities, the personal background of particular civil servants, etc. It is important to assess this dimension from the very beginning to understand the nature of the co-production process.

Figure 4: Capacity and willingness matrix

	High Capacity	**Low Capacity**
High Willingness	Willing and capable government. Co-production process likely.	Willing government with low capacity. Co-production process possible.
Low Willingness	Not willing but capable government. Co-production process possible.	Unwilling and with low capacity. Co-production process unlikely.

Source: Scrollini (2018).

3. Look at the data

The third step in the AI project co-production cycle is to assess the project's impact before starting work on the product itself.

In this step of the process, one should ask the following two questions:

- What data infrastructure is needed for this product?
- Can machine learning help to automate processes, inform decision-making or ca-

rry out sophisticated analyses?

Asking the first question will allow your team to identify the minimum data necessary to carry out the project, the person(s) in charge of this data, and the state and quality of the data. In order to obtain this information, teams can contact the data publishers to ask specific questions. In some cases, one of the co-production partners will be the data publisher, and will have first-hand access to this data. We define data infrastructure as the technical means, services and facilities used where data is produced, maintained and distributed. These are essential elements for AI projects because AI projects are only as good as the data they obtain.

We recommend asking yourself a set of basic questions about data infrastructure before embarking on any project:

Figure 5: Data Infrastructure Questions

Who is publishing the data?
Understanding who owns the data is essential to secure a good result in any process.

What data standards, if any, are being followed?
Understanding how the data are collected and structured is also important to apply any kind of machine learning solution. Having structured data will facilitate building tools with different, but standardized, data sources.

What missing data can you detect?
It is likely that not all the data points are available. For example, certain groups of people (e.g., persons of a certain gender or members of certain ethnic minority groups) may not be adequately represented.

Why do you need this data?
Some available data may not be needed to develop a product. Determine the data that is strictly necessary.

Will use of the data cause harm to anyone?
In the context of Empatía no ethical conundrums were identified, but if you think there is a chance of harming a particular group of people or persons it is important to understand the legal and ethical implications of the tool.

How recently were the datasets you need updated?
Having up-to-date data is necessary to continue supplying input to the tools developed during the co-production process. Using only historical data can be useful for building the tool, as they require very large amounts of data, but the more up-to-date the better to solve current public problems.

In Empatía, projects were developed by teams in the private and public sectors; however, all the projects use public data and rely on the state's data infrastructure. Thus, the projects depend on state producers of the data, generally government agencies or offices. If these governmental data infrastructures are not good, projects are likely to fail. The questions presented above allow you to evaluate the quality of the

data, and consider alternative data sources or rethink the viability of the project.

One lesson we learned over the course of the program is that ensuring the quality of data infrastructure requires a significant investment of time and effort. An example of this is the project led by CDS, Control Cívico. The team was able to use data from the DNCP and Colombia Compra Eficiente, which is published frequently using a standard (OCDS). In this case, the questions above can be answered as follows:

Figure 6: Data Standardization Example (CDS)

Who is publishing the data?
National Directoray of Public Procurement of Paraguy and Colombia Compra Eficiente.

What missing data can you detect?
Fields were missing from the OCDS mapping template, and despite using the standard, both entities publish slightly different data;

What data standards, if any, are being followed?
Open Contracting Data Standard;

Why do you need this data?
To understand information about public contracts such as monetary amounts, quantities, contracting entities, etc.;

Will you do any harm to anyone by using this data?
No, the data are publicly available and contain no personally identifiable information;

How recently were the datasets updated?
The datasets are updated daily.

In some cases, particularly in projects led by the public sector, the project leaders were also the people in charge of maintaining the data infrastructures, which afforded them 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 was the case of the Goblab + SMA project. The SMA were co-leads of the project and responsible for publishing the data. The questions above for this project can be answered as follows:

Figure 7: Data Standardization Example (Goblab UAI+ SMA)

Who is publishing the data?
Superintendence of the Environment of Chile (SMA)

What missing data can you detect?
Missing data for certain contaminants;

What data standards, if any, are being followed?
The Decree 104 establishes four emergency levels categorized by 1-hour concentration of SO_2 levels: regular, alert, pre-emergency and emergency; TimestampUTC as a temporal indicator;

Why do you need this data?
To measure contamination levels in the air;

Will you do any harm to anyone by using this data?
No, the data are publicly available and contain no personally identifiable information;

How recently were the datasets updated?
Hourly.

Overall, the SMA reported that they had valuable information to use with the AI tool they produce, such as online emissions reported by sources and air quality data. The data provide a minute-by-minute measure of different pollutants (PM, SO2, NOx, among others) and their flows (flow) in such a way that their mass emissions (mass/time) can be calculated. However, after the data assessment, the team concluded that the SMA lacked advanced modeling tools to take timely preventive measures (temporary reduction of emissions at sources or alerts to citizens), which would make it possible to avoid critical episodes and minimize their effects on the population. This is a good example of evaluating the data availability critically in order to consider what data are most needed for the project.

Once teams determine the type of data infrastructure needed for their products, the next question to ask is: Can machine learning help to automate processes, inform decision-making or carry out sophisticated analyses?

This question allows teams to reflect on the need to implement artificial intelligence technologies to solve a specific public problem. Maybe you do not need to use machine learning tools to solve the problem. Maybe you just need a good dashboard or accurate data with adequate visualization tools. It is important to pause and reflect on what kind of tool will provide the output or yield the outcomes you are looking for, as well as the level of effort you need.

4. Find technical experts to implement your vision

The next step is to find the technical expertise needed to develop and implement the project. Maybe you already have experts on board with you, and if so, you are lucky.

This was one of the main challenges in the implementation of all Empatía projects. A common concern across the region is the public sector's inability to compete with the private sector for technical expertise, since the market value of technical expertise in artificial intelligence is far beyond what the public sector can pay. In most cases, the solution to this problem is contracting external consultants who possess the needed technical expertise. This was the case of DINAGUA, who did not have the in-house capacity to deal with the project amidst a reorganization of the Ministry of Environment in Uruguay. As a result of the reorganization, DINAGUA explored new ways of developing contracts for artificial intelligence products, issued an open call for collaborators and identified a local firm that could deliver the product. The case of DINAGUA shows that hiring external consultants is not straightforward, particularly when using public money. The public sector will need to develop appropriate guidelines for hiring AI experts in the future.

Co-production offers an alternative. We argue that the logic of co-production of artificial intelligence projects for the public sector could bypass this hurdle. By combining two or more teams with different technical and subject-matter expertise. The transfer of technical skills from the private sector and civil society to the public sector allows the public sector to obtain skills that would otherwise be too costly and time consuming. Additionally, without established collaboration mechanisms that benefit both actors, these skills would not necessarily be accessible to projects in the public sphere, as they usually do not translate into immediate profits for the private sector. However, the public sector is not the only beneficiary of these collaborations; the public sector contributes with subject-matter expertise and access to public data that private entities would otherwise not have.

5. Develop and test the tool prototype using agile methodologies

For the next step, teams develop the prototype of their solution using agile methodologies. Developing a prototype is a necessary step that allows teams to test out their ideas before committing all their resources and time to the initial idea. Developing a prototype is useful to test the proposed solution, evaluate its technical feasibility, calculate the amount of resources needed for the final product and reduce the workload in subsequent steps of the project. In this stage, the teams can also provide feedback, and make adjustments to the prototype before testing it.

For some teams, the prototype stage occurred at the outset of the collaboration with their partners. In the case of IA, for example, the developers met staff of Juzgado (Court) No. 10 in a hackathon, where the Juzgado staff told them they needed a tool that would allow them to improve the anonymization process for judicial resolutions. Hackathons are good places to build prototypes; they provide immersive environments where co-production can be arranged for future collaboration. Instead of directly replicating a hackathon experience, Empatía built on the foundation of existing collaborations that were already dedicated to addressing a particular public problem, and extended the period of time allowed to develop solutions. Additionally, some hackathons reward only the winner (or winners) of the competition, whereas Empatía provides a set amount of funding for all the selected teams. While a hackathon can foster collaboration among technical and subject-matter experts, the aim of co-production projects is to formalize these collaborations over a longer period of time.

The next step is to test the prototype. After incorporating feedback from the design stage of prototyping, teams can test out the solution and identify what works and what

must be changed. Once the prototype passes the tests established by the team, the developers can start working on the final version of the tool. The Querido Diario project emphasized in their narrative reports the importance of validating the prototypes. The validation tests were essential for developing the backend of their project, i.e., the algorithms and APIs necessary to scrape and publish the data, and they validated all the prototypes before starting to develop the interface or front-end of their project, which yielded a user-friendly interface on the Querido Diario website.

6. Develop the tool

The next phase is developing the tool, once all the prototypes have been tested and are working according to plan. This step can be considered as a series of small steps that compose the bulk of the cycle. In this step, several teams argue that using agile methodologies are extremely useful for keeping the project on schedule and meeting all the deadlines for the deliverables. An example of the use of these methodologies is the GobLab + SMA project. They incorporated a data science pipeline, which included cleaning, preprocessing, and transforming the data to feed their machine learning models. In this pipeline, they decided to use scrum methodology, which enhances the development of products with an iterative and incremental focus to generate value as soon as possible.

However, using agile methodologies does not guarantee that things will always work out as planned, and teams have to consider possible situations that might delay a project. This was the case of Dinagua, who had originally planned to work using agile processes with iterations lasting 1-2 weeks. They planned to evaluate each iteration and to update the scope of the subsequent one accordingly, which would allow them to incorporate changes as needed. However, they did not anticipate institutional challenges that delayed the development of their tools significantly. As mentioned above, their inability to expedite hiring external consultants to carry out the project amidst institutional changes in the ministry significantly delayed the implementation of their project. This example illustrates that while the ideal form of the co-production cycle is step-by-step, all the steps continually interact, affecting the teams' ability to develop their tools as planned.

Some important questions to ask in this stage include the following:

Figure 8: Agile methodologies questions

Are agile methodologies part of the routine work of the partners in the project?
While some teams might be familiar with agile methodologies, it is important to make sure everyone involved knows what to expect and how to make agile methodologies effective for their individual work environments. Holding a training session at the beginning of the collaboration can help promote the use of these methodologies.

Would it be useful to hire an agile methodologies facilitator?
If none of the teams feels comfortable using agile methodologies, it might be a good idea to hire an agile facilitator to provide training to all team members in the initial phases of the program..Using agile methodologies can help teams save time and money in the long run, making the hiring of a skilled facilitator a worthwhile investment.

It is important to accurately estimate the funding needed to develop the tool as planned. In some of the cases we reviewed, the development of the tool occurred just as planned and teams were able to achieve their original objectives. However, because the projects only had limited funding, they had to be creative to achieve their new goals with the resources available. An example of this is Querido Diario: the team initially sought to reach 350 cities with the first prototype but they reached only 12 cities due to financial barriers rather than technical barriers. As the project advanced, they determined they had the capacity to publish data of 2200 cities, however they were not able to add all these cities to the platform due to the project's financial constraints. Querido Diario attempted a crowdfunding strategy, however this did not yield enough to finance the project's expanded objectives.

In some cases, the temas discovered during the development stage that the tool had much greater potential than they originally conceived. This was the case of IA ; however, in order to realize this greater potential, the team itself had to provide financial resources on top of the initial seed funding provided by Empatía. This allowed them to scale up the tool for use in other countries in the region and for other types of institutions, which required retraining the tool to fit these different contexts.

7. Use the tool and engage with relevant stakeholders

Once the tool is developed and ready to use, the next step is to use the tool and engage with the relevant stakeholders. The most important evaluation of the tool is its ability to contribute to solving the public problem identified in the design stage.

We follow Nabatchi, Sancino and Sicilia's (2017) typology of co-production, which places co-production projects in a 3 x 4 matrix by 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 prioritizing needed public services, outcomes, and users. In this phase, the public sector partners will use the tool, which the private sector organization creates

and implements, in collaboration with the needs and priorities of their partners. The second phase, co-design, refers to activities that incorporate the experience of users and their communities into the creation, planning, or arrangement of public services. In this second phase, the two teams work together to produce the strategy, design, and implementation of the tools; thus, both teams contribute their specific knowledge in all the steps of the design process. The third stage, co-delivery, refers to joint activities between state and lay actors that directly provide public services and/or improve the provision of public services. This stage can vary depending on the level of co-production (see examples of the various levels in Table 2). The last phase, co-assessment, focuses on monitoring and evaluating public services. In this phase, the tool is designed in collaboration and used by the public sector to monitor and evaluate the services. Table 2 below applies Nabatchi et al.'s (2017) framework to the Ematía projects.

Table 3: Nabatchi et al.'s (2017) co-production framework.

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 process of 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 Sustainability to design the algorithms to map the daily concentration of PM10 pollutants in Argentina.	**Goblab UAI + SMA** The two teams worked together to produce the regression and classification models that predict the concentration of pollutants in Chile.	**IA2** The project contributes to the ongoing activities of Juzgado n° 10, making them faster. It requires active engagement of the Juzgado n° 10 team to obtain access to needed documents and data	

Collective			**Querido Diario** This project scrapes data from official gazettes and publishes them in more accessible formats, which benefits the municipalities.	

The typology above also allows us to examine the relationship between the phase of the co-production cycle and the intended users of the tools. We use the concepts of direct and indirect beneficiaries, with direct beneficiaries being the intended users of the tool and indirect beneficiaries being all the other stakeholders that benefit from the tool being implemented. As can be observed in the tables, in most cases, the direct beneficiaries of the tool are the public sector co-production partners themselves. However, since the tools are designed to solve a public problem, they also have indirect beneficiaries. In most cases, these indirect beneficiaries are the specific populations that are affected by the problem the tool is helping to solve, while in some cases, the general population as a whole are the indirect beneficiaries.

Table 4: Project beneficiaries

Project	Main beneficiaries (Direct + Indirect)
Control Cívico	Direct: National Directorate of Public Procurement of Paraguay and National Public Procurement Agency of Colombia. Indirect: journalists and the technical community interested in the data.
IA2	Direct: Juzgado n° 10 de la Ciudad de Buenos Aires Indirect: journalist, citizens, NGOs, Poder Judicial Costa Rica, Poder Judicial Nuevo León (Mexico) Residents of Buenos Aires
Gob Lab + SMA	Direct: SMA Indirect: Citizens of Chile
ProsperIA	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 developing lethal and disabling complications from chronic diseases.

Querido Diario	Direct: 2,226 Brazilian municipalities Indirect: All Brazilian municipalities, citizens of Brazil,
CONAE	Direct: National Commission for Space Activities (CONAE), the "Mario Gulich" Institute for Advanced Space Studies (IG, CONAE/UNC) and the Argentine Ministry of Environment and Sustainable Development (MAyDS). Indirect: Citizens of Argentina
Dinagua	Direct: DINAGUA Indirect: Citizens of Uruguay

8. Ask different stakeholders to evaluate the usefulness of the tool

The last step in the cycle of co-production for artificial intelligence is to have different stakeholders evaluate the usefulness of the tool. This evaluation can be done for two main purposes: first, to detect any technical problems in the implementation of the tool, which can be done as soon as the tool is being used. The second evaluation, which seeks to assess how well the tool performs in helping to solve public problems, must be conducted at various intervals, such as every six months. This second form of evaluation generates quantitative and qualitative data to gauge the tool's success at achieving its objectives.

Examples of questions to ask at this stage include:

Figure 9: Evaluation questions

- How much is the tool being used by initially identified stakeholders?
- Is the tool delivering the expected results in terms of efficiency, effectiveness or expected use?
- Are there any unintended consequences associated with use of the tool?
- Is the tool sustainable in the long run? What new features could help it better achieve its goals?

Conclusion

Co-production is a viable alternative for building AI solutions to solve public problems. Co-production processes are based on dialogue, adjustment of expectations and identification of common needs. Our findings indicate that these processes bring new skills and perspectives to the public sector to tackle often complex problems. It is not surprising that co-production processes are not about the technology itself, but more about the interaction, co-creation and, ultimately, co-production of AI tools.

Can co-production processes operate at scale? At the moment, we do not have a definitive answer to this question. These processes offer a democratic alternative to the design of public services that aim to use machine learning technologies. Much of the road ahead involves demystifying AI and machine learning and thinking critically about specific usages of this technology that could promote the public good while also preserving the dignity and rights of people involved. Due to its iterative and dialogic nature, co-production offers this possibility. Ideally, governments would consider co-production processes as part of their AI strategies. This requires investing in civil society and governments' capacities, as well as supporting small and medium enterprises. In the long run, we believe AI is going to be increasingly adopted by governments. The way AI is adopted and implemented in the public sector will determine how these technologies affect society. Co-production sets us on a path toward a resilient, useful and participatory future.

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Visual guide Co-producing AI

Illustrated by Sofía Donner