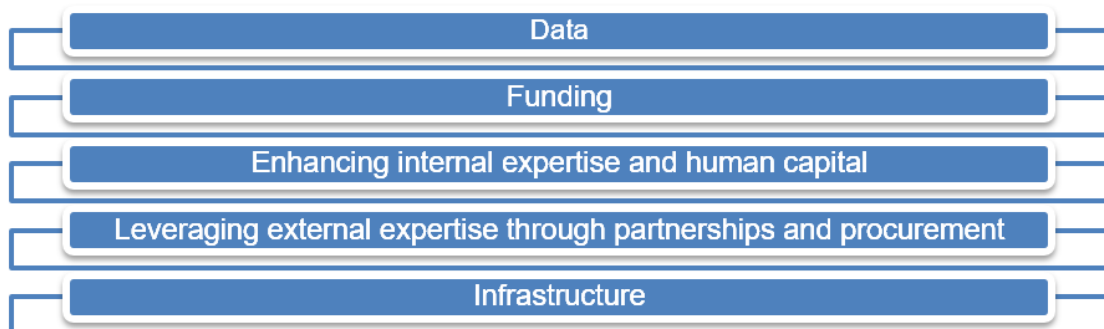# 6 Putting in place key enablers for AI in the public sector

AI strategies, principles and governance mechanisms are not enough to bring about meaningful progress in achieving AI goals. To make these things tangible, governments will need to ensure that adequate resources and other enablers are provided or otherwise accessible. This chapter explores the extent to which LAC governments are putting in place these resources and enablers.

Financial resources are a pre-requisite, and must to be addressed. Likewise, governments will need access to talent, essential products, services and infrastructure in both the public and other sectors. This involves evaluating ways to build up internal capacity as well as outsource talent and development to the private sector or other external partners. Regardless of approach, it is important that public servants have, at a minimum, a baseline level of data literacy and understanding of data science and related tools, as these become increasingly pervasive and, to some extent, obligatory to the future of governing. Thus, special attention should be paid to providing opportunities for public servants to develop these capacities, as well as to consider which competencies might be expected in the future. Finally, governments need appropriate digital infrastructure, such as cloud solutions that allow public institutions to access infrastructure, platforms, software and other services at low cost.[1] This section explores the extent to which LAC governments have put in place these key enablers, and identifies areas where further efforts are needed.

In particular, this chapter discusses the items presented in Figure 6.1.

Figure 6.1. Issues discussed in Chapter 6

| Data |
| Funding |
| Enhancing internal expertise and human capital |
| Leveraging external expertise through partnerships and procurement |
| Infrastructure |

Data

Most AI projects involve data as a critical input and enabler. This is especially true of Machine Learning projects where the objective is to learn from the data. However, not all data are equal and steps must be taken to ensure that the data used for an AI project is accurate, reliable and appropriate for the task at hand. Even when AI could be a solution to governmental problems, lack of basic data management techniques and government structures may limit its potential as an enabler for AI.

This report would be remiss if it did not stress the critical nature of data as perhaps the most critical enabler of AI. However, the forthcoming review, *Going Digital: The State of Digital Government in Latin America*, due to be published in 2022 will contain an in-depth exploration of LAC government capacities and practices around a data-driven public sector. Among other topics, the review will discuss data governance and issues relating to commons standards and interoperability between different IT systems, and will analyse LAC government Open Government Data (OGD) policies and initiatives directed towards increasing the openness, usefulness and reusability of government data, which can serve as fuel for AI across all sectors.

As the forthcoming report covers data in depth, this AI report does not include a dedicated analysis of data as a key enabler beyond issues related to the strategic layer of data governance (see the *Foundational strategic data governance capacities section* of Chapter 5), supporting data literacy and skills (see the *Enhancing internal expertise and human capital* section later in this chapter) and data infrastructure components important for AI development (see the *Infrastructure section later in this chapter*).

In addition, the published OECD report *Hello, World: Artificial Intelligence and its Use in the Public Sector* (Berryhill et al., 2019[1]) includes an in-depth discussion of the importance of data for AI systems (see the *Data as fuel for AI* section) and an overview of ways in which governments are securing the ethical collection, access to and use of quality data (see Chapter 4).

Funding

Funding and financing mechanisms are an important consideration for public sector applications of AI. Even simple initiatives need access to some level of funding and financial support to make the transition from concept to implementation. The availability and nature of this financing can contribute greatly to the eventual success of AI-based innovation (Berryhill et al., 2019[1]).

Figure 6.2. LAC regional capacities for funding AI efforts
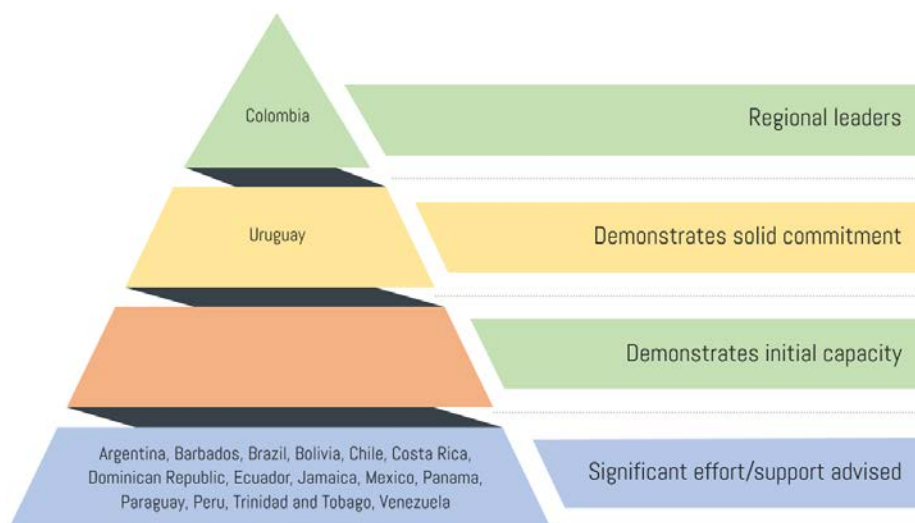
Note: This figure focuses on government capacities to consider and commit to dedicated funding specific for public sector AI efforts. It does not focus on individual public sector organisations seeking to fund public sector AI projects out of regular ICT budgets.

In interviews with LAC countries, a number stated that AI efforts were funded out of normal IT budgets, generally the budgets of individual institutions. This practice is common globally, including among LAC countries. However, the existence of dedicated AI funding mechanisms, or broader cross-cutting digital funding opportunities that can be used for AI, may assist in ensuring that the multitude of needs and demands government agencies face on a regular basis do not crowd out opportunities for AI exploration, experimentation and implementation. In addition, centralised or cross-cutting (rather than institution-specific) funding pathways can help identify common needs and potential synergies, as well as mitigate duplication and overlap.

As touched on earlier in this report, several LAC countries have developed funding approaches or mechanisms beyond traditional budget allocations that can help promote AI in the public sector:

- As discussed in Chapter 2, Colombia's national strategy[2] is unique in the region in that it provides for an explicit funding mechanism to support AI objectives and initiatives. It secures funding from various public sector institutions, generally at the national level. The strategy also explicitly shows funding amounts, where the money comes from (generally the general national budget) and where it flows to. In addition, as touched on in the *Understanding problems and the potential for AI solutions* section of Chapter 5, Colombia's Pact for the Digital Transformation of Colombia, carves out a central fund of USD 5.2 billion (equivalent) to address major digital challenges in the country, including through the use of emerging technologies (see Box 6.1). The potential for funding public sector AI initiatives represents one of many avenues for funding digital projects. The country's Digital Government Policy (Decree 620 of 2020) also provides for a Single Fund for ICTs to finance the implementation and operation of cross-cutting digital citizen services, including digital interoperability services and digital authentication. However, these efforts do not appear to be related to AI at present. Finally, Colombia's Science, Technology and Innovation Fund is allocated 10% of the income of the General System of Royalties to finance projects that "increase the scientific, technological, innovation and competitive capacity of the regions", including ICT projects that contribute to social progress, economic dynamism, sustainable growth and wellbeing.[3]

- As mentioned in the *Understanding problems and the potential for AI solution* section of Chapter 5, Uruguay's Sectoral Education Fund is dedicated to financing research projects on teaching and learning assisted by digital technologies, and includes a primary "research line" scoped around the

use of data and AI. According to their survey responses, Uruguay has also obtained financing for AI projects through arrangements with the Inter-American Development Bank (IDB) and CAF.

- Venezuela's Info-Government law[4] establishes an interesting funding model whereby the National Fund for Science, Technology and Innovation allocates at least 2% of the resources from contributions for science, technology and innovation, to finance programmes and promote plans to consolidate the national industry of information technologies. Subsequent iterations of this model are not specifically dedicated to AI, or even specifically to public sector programmes. Similar to Colombia's Science, Technology and Innovation Fund, this is an interesting approach to building a central fund for promoting digital initiatives, and may warrant further study.

In spite of these efforts, compared to other parts of the world dedicated funding options for AI in the public sector do not appear to have a focus in LAC countries. Where normal budgeting processes operate, and for most of the examples above, AI represents just one of many possible options for allocating funding. In the absence of dedicated funding, LAC countries may face difficulties in converting strategies and stated aspirations into real, concrete AI initiatives due to competing priorities. Some examples of dedicated funding for AI in the public sector from outside the region are presented in Box 6.1, which also provides details of regional funding mechanisms offered by CAF and the IDB which may help LAC governments seize opportunities for AI in the public sector.

Box 6.1. Examples of dedicated funding for AI in the public sector

Dedicated funding as part of a national AI strategy (Spain)

Spain's national AI strategy has pledged EUR 600 million in AI investments through 2025, which the country estimates will also serve to mobilise EUR 3.3 billion in private investments. Of this amount, 275 million will be allocated to technological development of AI, 133 million to integrating AI into all economic sectors, 100 million specifically for AI in the public sector, 42 million to promoting talent development, another 42 million for data platforms and 8 million to develop a normative ethical framework that reinforces the rights of citizens.

AI and quantum computing research institutes (United States)

The United States government has announced over USD 1 billion in funding for the establishment of 12 new AI and quantum information science (QIS) research institutes to be housed in Federal government agencies. The institutes, to be established over the course of several years, will serve as a place where "the Federal government, private sector, and academia will come together to drive transformative AI and quantum breakthroughs."

Funding national AI strategy implementation (Estonia)

From 2019 to 2021, the Estonian government funded the implementation of the country's national AI strategy, "KrattAI", with EUR 10 million.

Funding to launch key AI-enabled public services (Finland)

In April 2019, the Government of Finland published *AuroraAI – Towards a Human-Centric Society*, which provides a five-year (2019-23) implementation plan for the country's national digital government strategy, AuroraAI. One action item is to allocate EUR 100 million in funding, spread across 2020-23, to launch 10-20 services focused on life events and business practices.

Regional funding for the strategic use of AI in LAC (CAF)


CAF, Development Bank of Latin America, is leading an initiative to promote the strategic use of data and AI in the public sector of its 19 member countries. The organisation solicited proposals from its members focused mainly on projects that had moved beyond design and piloting and were close to implementation. The process yielded 89 proposals from 11 countries. The main issues raised by the proposals related to citizen services, online procedures, purchases and contracts, disease management, the environment, and urban mobility and planning. CAF then evaluated the proposals against pre-identified criteria: relevance, impact, efficiency and effectiveness, potential to combat corruption, ability to empower citizens to contribute to solving public problems, scalability, replicability and the potential to link with other initiatives. To date, CAF has delivered approximately USD 800 000 (equivalent) in funding through non-reimbursable technical co-operation grants.

Source: www.energy.gov/articles/white-house-office-technology-policy-national-science-foundation-and-department-energy, https://ati.ec.europa.eu/news/estonian-public-services-age-artificial-intelligence, CAF officials and www.caf.com/es/actualidad/noticias/2020/06/cierra-la-convocatoria-de-caf-para-desarrollar-un-proyecto-de-datos-e-ia-en-una-ciudad-latinoamericana.

Enhancing internal expertise and human capital

In addition to funding, other critical enablers for AI in the public sector include access to human capability and capacity. Governments can obtain the necessary human capital *internally* through innovative approaches to training and recruiting in new talent.[5] In addition, they can augment in-house human capital through *external* arrangements brought about through procurement or partnership, as discussed in the next section. In order to realise the potential of AI in the public sector, governments will likely need to pursue a mix of approaches.

Figure 6.3. LAC regional capacities for bolstering internal human capital for AI
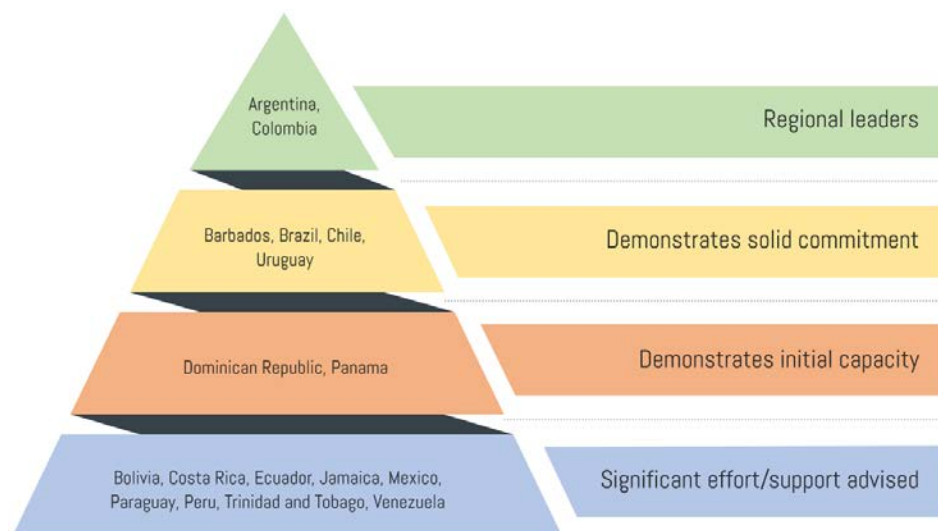

The potential for widespread AI transformation is likely to have substantial implications for the skills required to effectively deliver public services. These needs have been further emphasised by the COVID-19 crisis, with OECD research finding that a key public sector outcome of the pandemic has been the "rapid acceleration of digital innovation and transformation", with digital skills a vital component to keeping up and shifting to new environments and ways of working (OECD, 2020[2]). Given the critical and foundational nature of digital skills in the public service, the OECD Public Governance Committee's (PGC) Working

Party of Senior Digital Government Officials (E-Leaders) (supported by the Digital Government and Data Unit), in co-ordination with the Working Party on Public Employment and Management (PEM) and the Observatory of Public Sector Innovation (OPSI), has developed a new digital skills and talent framework for the public service. The aim is to shift from a sole focus on technology towards a mindset and culture, supported by technical skills, capable of designing government services that are more open, collaborative, inclusive, innovative and sustainable (OECD, 2021[3]). Findings show that AI-related skills, such as the use of data and technology in a trustworthy manner, are critical.

Within the LAC region, as discussed above (Figure 5.7), only a couple of surveyed countries (Dominican Republic and Uruguay) indicated their agreement that their public servants understand AI and its uses and limitations. This hints at a deficit of AI skills among current public servants. Fortunately, most LAC governments confirmed that improving the digital skills and competencies of public servants was a high priority (Figure 6.4).

Figure 6.4. Priority given to improving the digital skills and competencies of public servants
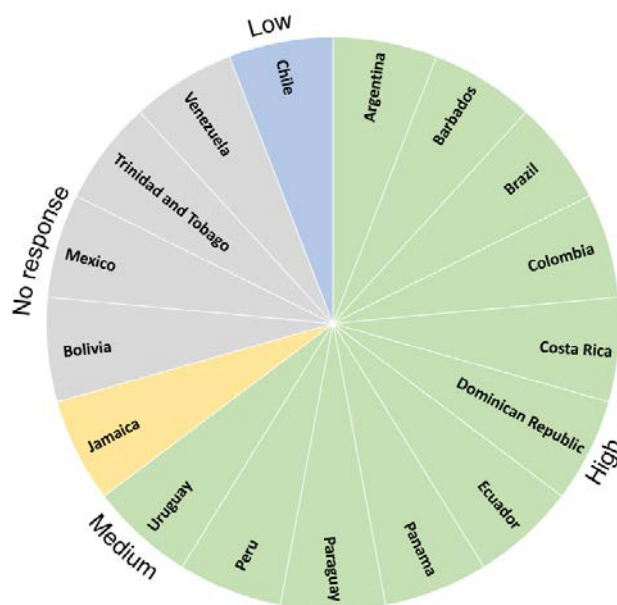
Source: OECD LAC Digital Government Agency Survey (2020).

This high level of priority can be observed in a number of LAC countries which have made significant efforts in recent years to enhance the data literacy and associated skills of public servants. Such skills serve as a solid foundation for subsequent AI-focused upskilling. Countries surveyed also reported positive opinions regarding the digital literacy of public servants. Figure 6.5 illustrates these points.

Figure 6.5. Countries have initiatives to enhance in-house data literacy and public servants have data literacy skills

Countries with strategies/initiatives to enhance in-house data literacy

Extent to which public servants have data literacy skills
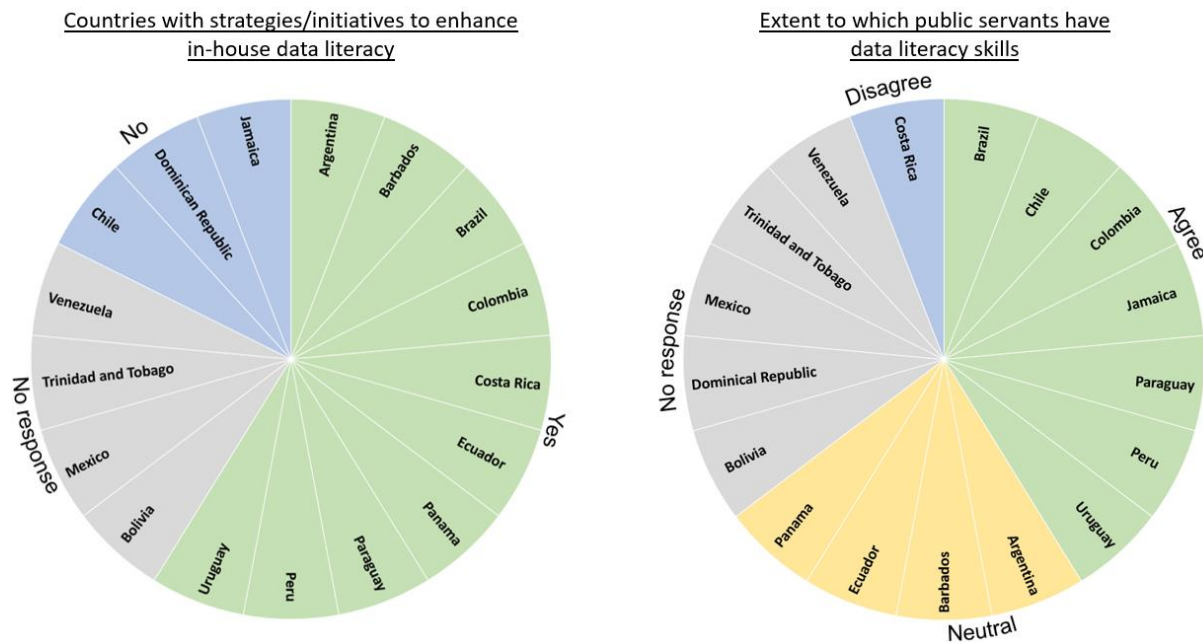
Source: OECD LAC Digital Government Agency Survey (2020).

Some examples of data literacy efforts include the following:

- Argentina's National Institute of Public Administration (INAP) offers a number of courses for public servants aimed at promoting data literacy, including on database management, big data and data visualisation.[6] In addition, the country's Secretariat of Public Employment has developed a series of data skill development programmes that target different groups of public sector employees (e.g. young officials, senior leaders) (OECD, 2019[4]). LABgobar also works to develop more technical data skills among public servants (OECD, 2019[5]).

- The Barbados Learning and Development Directorate[7] has co-ordinated a variety of virtual courses[8] related to data literacy, available to public servants as well as members of the public. Relevant courses include database concepts, database systems, and algorithms and programming concepts.

- The Brazil national AI strategy includes an action item to encourage public agencies to implement a training programme for its workforce on new technologies. In addition, the country's National School of Public Administration[9] offers courses on data literacy and data science aimed specifically at public servants. Such courses include data governance, data science, regression analysis and data protection.[10]

- Colombia has developed training courses on a number of topics related to open data. Examples include training on what types of data to publish and how, using and exploiting data on the government's open data portal, and data accessibility and security. Training courses are aimed at different audiences, including public servants, national and sub-national levels of government, journalists and civil society representatives. The country publishes a dataset of their open data training offerings on the open data portal.[11] In addition, the government's experimental *Catalizadores de la innovación* (Catalysts of Innovation)[12] programme, developed in co-ordination with UNDP, selects public servants for training in the use of tools and methodologies for innovation

which they must apply to solve a challenge with the support of ICT. This training and the resulting solutions may involve data and emerging technologies, including AI. Another relevant programme linked indirectly with public sector data literacy efforts is the ICT Mission 2022, which seeks to train 100 000 Colombian youth and adults in programming (including public servants).[13] According to officials, those who finish the training have an opportunity to become public servants or contractors for the different entities of the Colombian state.

- According to Panama's Agenda Digital 2020, the country is building out a new e-learning programme for 80 public sector organisations on opening up data, and is training a number of officials on data governance.

While efforts to instil solid data literacy skills in public servants appear to be moving in the right direction for many LAC governments, more needs to be done to build on these skills and provide specific upskilling on AI and associated topics (e.g. machine learning and AI ethics), as these involve unique nuances, opportunities, challenges and risks. This challenge extends beyond LAC countries, with initiatives to develop, motivate and deploy internal public sector talents for AI still largely inadequate at the global level (Ubaldi et al., 2019[6]). Indeed, emerging technology skills shortages are often cited by government officials as an obstacle, in interviews with the OECD, with regard to the exploration and use of such technologies, including AI.

Some LAC governments appear to be making progress in this area by committing to or developing capacity building programmes for public servants. In particular:

- Argentina's national AI strategy (Government of Argentina, 2019[7]) recognises that "the use of AI requires that public institutions redefine part of their management schemes and strategies based on new technologies. With the introduction of intelligent systems, the need to reconvert roles and tasks of public employees is generated." The strategy includes a key goal for "Dissemination and training of Officials and Agents of the National Public Service in the use and exploitation of AI in Government Services and Solutions." It also commits to developing AI-oriented talent and technical capabilities in AI in both the public and private sectors. Efforts in this area are already underway, with INAP offering face-to-face and online training sessions on AI (OECD, 2019[4]).

- As part of its Public Sector Modernization Programme,[14] Barbados commits to develop a public sector training plan and training and upskilling for public sector employees, including in disruptive technologies. In their response to the digital government agency survey, Barbados officials stated that the government is now placing additional emphasis on strengthening skills related to emerging technologies and other priority areas (e.g. cloud computing, cybersecurity).

- Chile's national AI strategy and action plan, launched in October 2021, call for training efforts to upskill public servants and members of the public alike. Such efforts include training, incentives and new management structures to further the use of AI in the public sector. The action plan proposes the creation of a dedicated management programme and states that the government is already working with the IDB's fAIr LAC initiative (see Chapter 2) to train public officials on AI.

- Colombia's Digital Talent programme offers training on AI to public servants and citizens alike, and has trained thousands of individuals in AI skills (see Box 6.2).[15] In addition to creating its own training programmes, the Colombia government has created a Call for Digital Transformation fund to finance external training opportunities for public servants in subjects such as AI and machine learning.[16] Finally, as touched on earlier, the country's Catalysts of Innovation helps selected public servants improve their ICT skills in ways that can enhance AI capabilities.

- Peru's draft national AI strategy for 2021 states that the country will promote courses or diplomas in programming and AI for officials of public sector organisations, and also plans to develop online courses for public officials on the adoption, use and benefits of AI. The draft also states that Peru will create a decentralised National Centre for Innovation and AI as an accelerator and facilitator

of AI research and development in all regions of the country, although it is unclear whether this includes the use of AI in the public sector.

- Uruguay delivers training courses for public servants in a variety of subjects, including AI, on its virtual educational platform, according to officials who responded to the digital government agency survey.

Box 6.2. Training thousands of public servants and citizens in AI (Colombia)

The Colombian Ministry of Information and Communications Technologies (MinTIC) has developed a Digital Talent Strategy in order to address the challenges of the Fourth Industrial Revolution. The principal objective of the strategy is to accompany citizens throughout their life cycle, starting with education in digital skills at an early age, followed by training for students at public schools and public and private universities, and then skilling and reskilling for professionals in areas linked to the digital creative industries, industries 4.0 and information technologies.

In 2019, as part of its digital skills training strategy, the country developed a suite of online courses on topics related to digital transformation and AI. The courses were made available to over 25 000 Colombians (public servants and members of the public), with 12 000 training slots specifically reserved for Colombians seeking to train as AI professionals. Since then, the efforts have expanded, with plans to train over 50 000 Colombians in digital skills, including those important for AI. The training courses include a particular emphasis on upskilling Colombians currently experiencing unemployment.

Source: https://mintic.gov.co/portal/inicio/Sala-de-Prensa/Noticias/106989:Mas-de-25-000-colombianos-podran-formarse-gratis-en-Inteligencia-Artificial-y-habilidades-para-la-transformacion-digital-gracias-a-MinTIC, www.talentodigital.gov.co and www.oecd.ai/dashboards/policy-initiatives/http:%2F%2Faipo.oecd.org%2F2021-data-policyInitiatives-26076.

These efforts are commendable and may be of particular importance for technical skills needed for specific roles. Where a more general AI-focused skillset is needed to educate a broader swath of public servants, LAC governments may be able to leverage existing third-party solutions at no cost. In particular, many citizens and public servants around the world have benefited from the free AI training curriculum *Elements of AI* (Box 6.3), and over 15 000 people have participated in the Artificial Intelligence Multidisciplinary Training Programme developed by the University of Buenos Aires Innovation and Artificial Intelligence Laboratory (IALAB), which CAF has supported with scholarships (Box 6.4).

Box 6.3. Elements of AI

Elements of AI is a freely available online training course that was developed jointly by the University of Helsinki and Reaktor, a consultancy and agency services organisation. Its curriculum is devoted to AI concepts, their societal implications and the building of AI systems.

Unlike most AI courses, Elements of AI is designed to be broadly accessible and requires no previous technical skills. It combines theory with practical exercises, all of which can be performed at the participant's convenience. The first part, "Introduction to AI", helps participants to understand the nature of AI, what is and is not possible, and how it affects everyday lives – with no complicated maths or programming required. Importantly, it also covers the societal implications of AI, such as data bias and the potential for algorithmic discrimination, and seeks to explain how to rectify these issues, while suggesting ways to help safeguard data. The second part of the course, "Building AI", launched at the

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end of October 2020, and allows students to dive deeper into the world of AI and learn about the algorithms that make the creation of its systems possible. Once students have understood the basics, they can start to explore the fundamentals of coding AI systems using the programming language Python. Each exercise gives users a choice of three levels of difficulty:

- Easy – no coding at all.

- Medium – students modify code that is provided to them.

- Difficult – students write new code from scratch.

The initiative launched with the objective of training 1% of Finland's population. Having achieved this goal, it now aims to train 1% of all European citizens. The course is open to anyone in the world, with translations underway in the 24 official EU languages (English, Spanish, Portuguese and others are already available). To date, 530 000 students from 170 countries have signed up.

Source: www.elementsofai.com and https://trends.oecd-opsi.org/trend-reports/upskilling-and-investing-in-people.

Box 6.4. Artificial Intelligence Multidisciplinary Training Programme

The Innovation and Artificial Intelligence Laboratory (IALAB) at the University of Buenos Aires has developed the Artificial Intelligence Multidisciplinary Training Programme as a means to advance the AI ecosystem in Latin America.

The training programme is oriented around several training profiles, including full-stack programmer, data lead, AI project manager and AI programmer. The core of the course consists of four modules:

1. Start Coding – 150 hours on relevant programming languages, such as JavaScript, React, React Native and Node.js.

2. Governance of Data, Information and Knowledge – 120 hours on processes, functions, policies, standards and measurements that help ensure the effective and efficient use of information.

3. Algorithmic Governance – 60 hours on global, ethical, legal, technical and operational guidance for achieving the traceability and auditing of AI systems.

4. AI Design, Programming and Deployment – 200+ hours on applying automation techniques and AI systems adapted to organisational challenges.

The programme is a self-paced virtual course, with synchronous tutorials and asynchronous communication with participants and professors also available.

CAF has supported the programme by providing full sponsorships for 150-500 hours of training spanning both theoretical and practical aspects of AI, with efforts including special targeting of public servants.

So far, more than 15 000 people have participated in the programme, including mainly public officials, small and medium enterprises, and women in the region. IALAB has set a goal to reach 50 000 participants by the end of 2022.

Source: https://ialab.com.ar/programa-de-formacion-multidisciplinario-de-inteligencia-artificial and www.caf.com/es/actualidad/convocatorias/2021/08/programa-de-formacion-multidisciplinario-de-inteligencia-artificial.

In looking to infuse the public sector with the right skills and expertise, LAC government efforts to enhance in-house AI capacity through strategic recruitment are significantly less pronounced than those related to upskilling existing public servants. While there is evidence of multi-disciplinarity and diversity-based initiatives to promote inclusive hiring and recruitment (see section on *Ensuring an inclusive and user-centred approach* in Chapter 4), the OECD could find little evidence among LAC governments of targeted recruitment of individuals with AI skills and expertise. Argentina's national AI strategy hints at this with an action item to create an "Expert Technical Team" on AI, which will act as an internal consulting body that public sector organisations can consult on the design and implementation of AI projects. Where the government expects to source these experts from is not explicitly stated in the strategy, however.

Beyond a specific focus on AI, there appears to be little explicit effort dedicated to recruiting technical talent with broader or other digital skills. Some exceptions do exist, such as Brazil, whose national digital government strategy includes an objective to expand the workforce by 2 000 professionals by 2022, including through recruitment efforts. Brazil has also established streamlined hiring processes for some 400 temporary officials, in order to catalyse digital government, according to officials interviewed by the OECD. In Argentina, the recent government identified recruitment of new talent as a top priority and opted for temporary employment models that provide higher compensation, compared to market costs, as a means to attract new talent, and counterbalance the salary gap between the public and private sectors (OECD, 2019[4]). Globally, there has been a significant push to couple the upskilling of existing employees with focused efforts to attract digital experts to the public service (see Box 6.5). LAC governments should explore ways to make public service attractive to talented individuals in other sectors as well as options to incentivise highly skilled individuals to join the public service. They may also want to explore hiring mechanisms that can streamline and quicken hiring processes for positions with in-demand AI skills.

In seeking to recruit new types of talent, governments will also need to reshape roles and job profiles, which will necessitate identifying competitive pay and conditions, while remaining within the constraints of existing public sector pay arrangements. As this may represent an obstacle to bringing digital government skills in-house, governments might consider procuring expertise from the private sector (OECD, 2020[8]). They may also need to seek changes to existing laws, policies and practices. For instance, flexibly hiring mechanisms may require changes in legislation in some countries.

Box 6.5. Recruiting technical talent in government

Tours of duty (United States)

Hiring staff for shorter periods of time can sometimes be quicker and easier for governments than recruiting permanent staff. This type of non-permanent hiring may be a good fit for digital innovation projects, where such arrangements can allow for a regularly refreshed pool of talent with modern digital skills and abilities. The US government, for example, has introduced the concept of "tour of duty hiring".

According to US documentation, "By leveraging temporary tour-of-duty employment opportunities (also known as details), Federal agencies can tap into new talent willing to serve their country. Using flexible hiring authorities allows agencies to recruit executives, entrepreneurs, technologists, and other innovators willing to enter government service for a short period." The documentation also outlines several potential models and checklists for project leaders to consider.

Tour of duty hiring has been used to recruit technologists for the United States Digital Service (USDS), and the 18F and Presidential Innovation Fellows (PIF) programmes, among others.

Joint Centre of Excellence for AI (France)

In March 2018, President Emmanuel Macron presented a strategy and vision to make France a leader in AI. The strategy was informed by the March 2018 report, *For a Meaningful Artificial Intelligence:*

Towards a French and European Strategy, commissioned by the French Prime Minister. The report noted that, "not all administrations possess the same level of maturity in terms of reflecting on the usage of AI in their specialist areas and their implementation processes. A major difficulty resides in the capacity to source the right skills for keeping up with the pace of innovation, identifying their applicability, and potentially transforming them into an initial proof of concept." Among numerous commitments and proposals, the report includes an action item to create "a Joint Centre of Excellence for AI at the State level to help recruit AI talent and to serve as an advisor and lab for public policy design". Such a centre was intended as a temporary measure, as over time other public sector organisations would become more capable of identifying needed AI skills and recruiting needed talent.

The OECD was unable to find evidence that Joint Centre has been fully implemented. However, it represents a promising model for recruitment and expertise specifically related to AI.

Source: https://github.com/GSA/innovation.gov/issues/25, https://oecd-opsi.org/wp-content/uploads/2019/05/implementation-with-EC-cover-1.pdf, www.aiforhumanity.fr/pdfs/MissionVillani_Report_ENG-VF.pdf and www.oecd.ai/dashboards/policy-initiatives/http:%2F%2Faipo.oecd.org%2F2021-data-policyInitiatives-25374.

Many LAC countries have actively demonstrated a high level of commitment to upskilling public servants in subjects beyond the data literacy and AI upskilling efforts discussed here, In particular, major training and recruitment initiatives are focused on broader or other specific digital transformation and innovation skills. In fact, most LAC countries have specific provisions in their digital government strategy, or other targeted initiatives, related to strengthening the digital transformation capabilities of public servants. The forthcoming report *Going Digital: The State of Digital Government in Latin America* will cover these topics in depth, including strengths and weaknesses related to digital skills and capacities in the region, and will provide recommendations for improvements in this area. Many LAC governments have also developed upskilling efforts related to AI and other digital skills for the broader public. Such actions, while much needed, generally fall outside the scope of the OECD's digital government work, which focuses on public sector transformation.

Moving forward, LAC governments need to ensure that public servants at all levels possess appropriate AI skills and capacities, as current efforts tend to maintain a focus on technical staff. Of critical importance is a technologically literate senior leadership cadre, with a strategic understanding of what AI can do and the types of problems it can address, able to champion the deployment of AI in government (Agrawal, Gans and Golbfarb, 2018[9]).[17] Managers of AI-enabled services will require deeper technical expertise, even if the services are delivered by external contractors, in order to negotiate effective contracts and assess whether specific AI approaches are fit for purpose. Crucially, both senior leaders and managers will need to be equipped to manage change.

In addition, as LAC governments mature in this area and continue to build up in-house AI skillsets and recruit individuals with AI knowledge and expertise, they will need to consider long-term needs for AI skills and capacities. Governments should bear in mind that AI will continue to change the dynamics of work and the requirements for success in the public sector for the foreseeable future. This underscores the need for lifelong learning and growth. Governments will therefore need to develop lifelong learning programmes, and iterate and adapt these programmes over time. Canada's Future Skills initiative, as detailed in the OECD report *Hello, World: Artificial Intelligence and its Use in the Public Sector* provides an interesting approach that could be useful for public sector capacities, as well the broader society and economy.[18]

Leveraging external expertise through partnerships and procurement

In many instances, AI skills and expertise are not readily available in government, and upskilling and recruiting programmes to import such talent can require significant investments in time and may encounter

bureaucratic hurdles. In addition to building internal capacity, governments may draw upon the private sector (e.g. large firms or innovative GovTech startups), academic and civil society actors, as well as the public in order to leverage their expertise and resources.

Figure 6.6. LAC regional capacities for leveraging external expertise and insights for AI
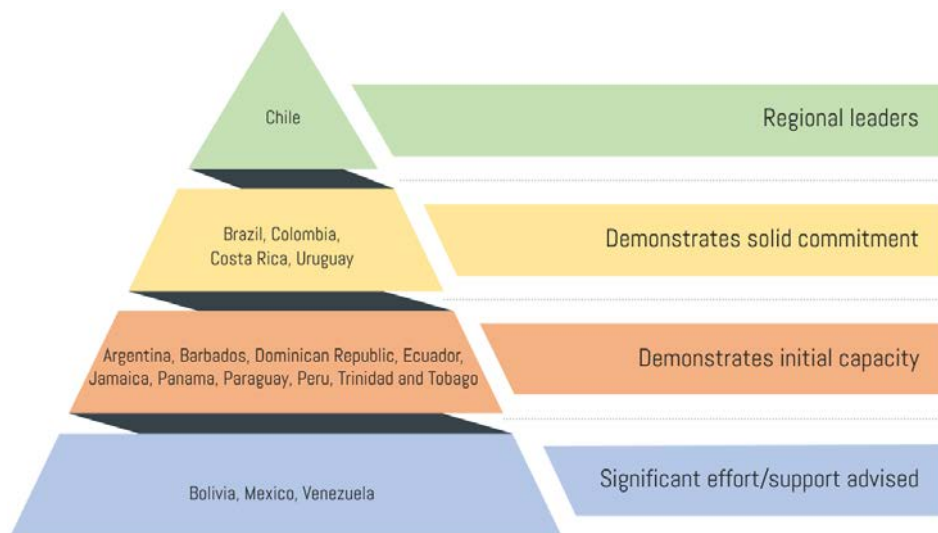
Many LAC governments are well-positioned to bring in external knowledge and insights through open processes for the design and development of their digital policies and services, which should also apply to those related to AI (see Table 6.1 and Table 6.2).

Table 6.1. Public organisations involving external actors in service design and development

	Private sector	Academia	Civil society
Argentina	✓	✓	✓
Barbados	✓	✓	✓
Brazil	✓	✓	✓
Chile			
Colombia	✓	✓	✓
Costa Rica	✓	✓	✓
Dominican Republic	✓	✓	✓
Ecuador			
Jamaica	✓	✓	
Panama	✓		
Paraguay	✓	✓	✓
Peru	✓	✓	✓
Uruguay	✓	✓	✓

Note: Data are not available for Bolivia, Mexico, Trinidad and Tobago, and Venezuela due to a lack of survey responses. "Private sector" includes countries who answered affirmatively to "private sector" and/or "GovTech start-ups and entrepreneurs".
Source: OECD LAC Digital Government Agency Survey (2020), corrections from Colombia dated 2 December 2021.

Table 6.2. Methods used to engage external stakeholders in digital service and policy design

	Design sessions	Focus groups	Public consultations	Social media	Wiki approaches
Argentina			✓	✓	✓
Barbados	✓	✓		✓	
Brazil	✓		✓		
Chile	✓	✓			
Colombia	✓	✓	✓	✓	
Costa Rica			✓	✓	
Dominican Republic		✓	✓	✓	
Ecuador			✓		
Jamaica		✓			
Panama	✓				
Paraguay					
Peru	✓	✓	✓	✓	
Uruguay	✓	✓	✓		

Note: Data are not available for Bolivia, Mexico, Trinidad and Tobago, and Venezuela due to a lack of survey responses.
Source: OECD LAC Digital Government Agency Survey (2020), corrections from Colombia dated 2 December 2021.

These efforts are commendable and can result in completely new concepts and insights being introduced into the public sector. For instance, in the Dominican Republic, more than 80% of new digital services were initially suggested by the general public, according to digital government agency officials. Some countries are setting up formal structures to capture such insights and views, such as Uruguay, which has committed in its national digital government strategy to developing an online catalogue of public participation instances, including feedback and satisfaction scores. The country has also committed to implementing citizen innovation funds and a sustainable process of co-creation between government and civil society representatives, entrepreneurs and companies. Colombia has also built a forum structure for capturing citizen views through its Crystal Urn programme (Box 6.6), with specific attention to enhancing government transparency. The Governments of Uruguay[19] and Chile[20] organized a multi-stage public consultation process to generate initial thinking specifically on national AI priorities and needs through roundtable discussions, webinars and other outreach activities, and then obtain feedback on the draft text of the strategy. Chile's LabGob provides guidance and methods on how to harness external insights (see Box 6.7). Other governments, such as Costa Rica,[21] have also issued solid guidance on the topic, although such guidance is somewhat less detailed in walking a public servant through processes step-by-step.

Box 6.6. The Crystal Urn (Colombia)

The Crystal Urn (*Urna de Cristal*) is a Colombian government initiative launched in 2010 to promote electronic citizen participation and government transparency, which has since evolved into an open government portal. The initiative consists of a multichannel platform integrating traditional communication media (television and radio) with digital media (social networks, SMS and websites). These channels are made available to all national and territorial government entities to facilitate the creation of participative forums at all levels, with a view to improving relations between citizens and the state. Through the portal, Colombians can influence the decisions of leaders and become informed about government results, progress and initiatives. They can also transmit their concerns and proposals

directly to government institutions, and participate and interact with state management, services and public policies. This creates a binding relationship between citizens and the state.

Source: (OECD, 2018[10])

Box 6.7. Guidance on harnessing external expertise and insights (Chile)

Chile's LabGob has developed a series of documents entitled *Allowed to Innovate: Guidelines to Transform the Chilean State*, which help to guide public servants in understanding innovation and using innovative practices to drive better outcomes for government. Within this series, two documents help public servants engage with and gain thoughts and expertise from external actors and groups.

The first, "How Can We Solve Problems through Competitions and Open Innovation?", seeks to promote open innovation processes in the public sector and make "a commitment to the collective intelligence that resides in entrepreneurs, academics, SMEs, students, NGOs, public servants and any citizen, no matter how far". The document also highlights the potential of open innovation to provide government with access to ideas and solutions about which it was previously unaware.

In seeking to systematise the experience of open innovation, the guidance provides methodologies, models, tools and case studies for open processes to leverage external expertise. It also details guidance to help public servants work through the eight phases of an open innovations process or competition:

1. Initial exploration.

2. Call for strategy and design.

3. Diffusion and application period.

4. Initial filtering and selection.

5. Accelerated incubation.

6. Communication and final evaluation.

7. Piloting and evaluation.

8. Implementation.

The second document, "How Can We Facilitate Face-to-Face Spaces for Public Innovation?", is based on lessons derived from co-design workshops held over 2015-2018. The document provides practical information on how to structure face-to-face session and workshops, and outlines key roles and responsibilities for such sessions and actionable guidance divided into eight phases:

1. Define a purpose.

2. Define an audience.

3. Workshop design.

4. Management and logistics.

5. Initial preparation.

6. Workshop execution.

7. Evaluation.

> 8.   Systemisation and analysis.
>
> This guidance is adaptable and could be used in a variety of settings and countries in order to obtain insights and views from external actors, including stakeholders and users.
>
> *Source*: https://innovadorespublicos.cl/documentation/guide and https://innovadorespublicos.cl/documentation/publication/39.

With regard to AI policies and services in particular, many governments around the world have identified a need to engage in more dynamic, specific, targeted arrangements with actors or organisations in other sectors in order to drive progress. This need is especially acute when dealing with new topics such as emerging technologies. In such cases, governments may not be able to create public value without external involvement, and the transformational potential of and outcomes of AI policies, initiatives and solutions will need to be co-produced. Strategic relationships with other sectors are essential to achieve a common direction, tap into new abilities and expertise in leading-edge practices, and strengthen public perceptions and trust. Each sector has unique strengths and competencies, and the biggest digital innovation successes occur when they come together.

The most common types of arrangements identified by the OECD involve cross-sector partnerships and collaboration (e.g. public-private partnerships), and public procurements for private sector expertise (Berryhill et al., 2019[1]). Working beyond governmental boundaries is critical in this regard. The OECD has previously found that engagement with the private sector is one of the most important enablers for public sector adoption of emerging technologies, including AI (Ubaldi et al., 2019[6]). Moreover, working with civil society and academic institutions can allow governments to tap into insights and specialised skills in many related areas. Challenges and prizes, as discussed earlier in the *Understanding problems and the potential for AI solutions* section in Chapter 5, is one way to kick-start these types of arrangements. Governments in the LAC region have also undertaken other types of action to support these collaborations, to varying degrees.

In regard to cross-sector partnerships and collaboration, LAC governments do not seem to leverage public-private partnerships on a frequent basis (Figure 6.7). While many LAC governments have developed and demonstrated competencies for engaging external actors in activities such as consultations, in order to solicit ideas and feedback on proposals, they have yet to build out to a significant degree cross-sector partnerships and collaborations that are more formalised, hands-on, engaged and mutually beneficial.

Figure 6.7. LAC governments indicate that they leverage public private partnerships
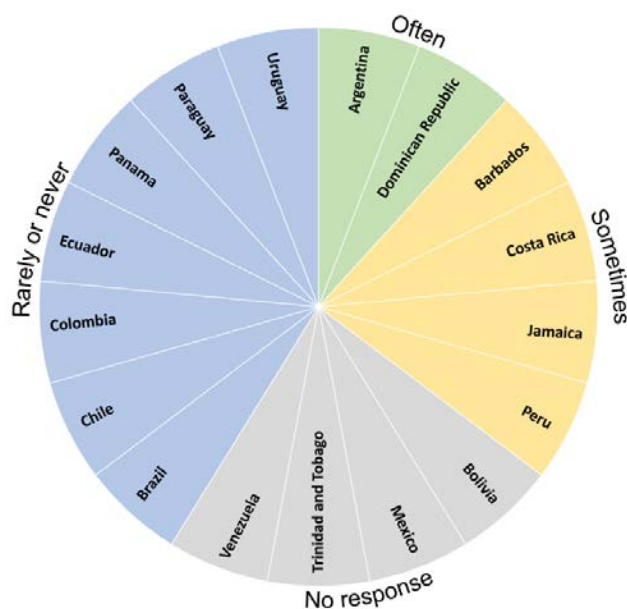
Source: OECD LAC Digital Government Agency Survey (2020).

In regard to AI, governments can benefit greatly from ongoing, active cross-sector partnerships in which each sector has a concrete role and contributions. While survey results indicate a lighter touch with cross-sector collaboration, they also indicate that the environment of many LAC countries may welcome a stronger emphasis on cross-sector partnerships and allow for success (Figure 6.8).

Figure 6.8. Digital government agencies support the government's ability to partner with other sectors (private, non-for-profit, citizens)
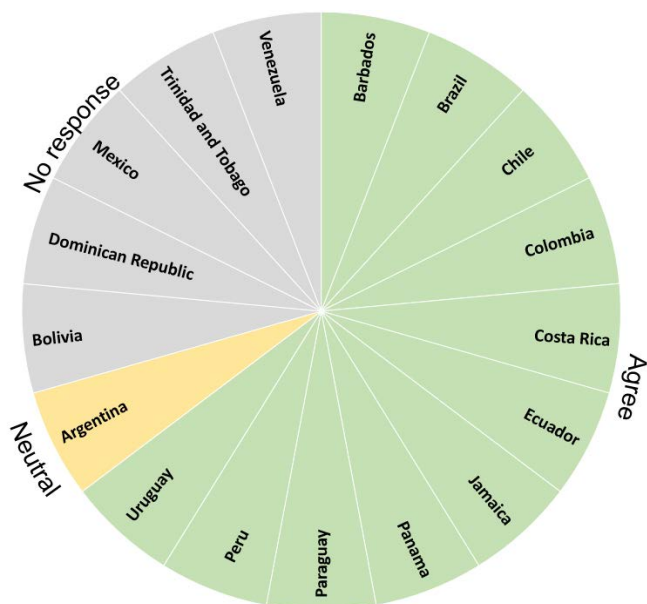
Source: OECD LAC Digital Government Agency Survey (2020).

Although efforts in these areas are not strongly pronounced, LAC governments have initiated a number of solid initiatives in relation to AI. For instance, as previously identified by the OECD (Ubaldi et al., 2019[6]), countries such as Chile and Panama have promoted public-private collaboration through a series of Memoranda of Understanding (MoU) to implement pilot experiences in the fields of Big Data, Cloud Computing and AI. Additional relevant efforts are underway including hackathons and challenge initiatives, as discussed in the *Understanding problems and the potential for AI solutions* section of Chapter 5. Efforts in the region include the following:

- Argentina has hosted a number of cross-sector hackathons, some of which have produced AI-enabled solutions.[22] The country's national AI strategy also promotes research, development and innovation initiatives aimed at basic and applied science in AI, both in the public sector and the private. Previous OECD work has found a need for creating stronger bridges, partnerships and synergies between the public and private sectors (OECD, 2019[4]), indicating room for additional growth in this area.

- Brazil's national AI strategy includes an action item to "establish connections and partnerships between the public sector, the private sector and scientific and universities in favour of advancing the development and use of AI". In addition, the country's national digital government strategy, under an objective on emerging technologies, calls for at least six research, development and innovation partnership projects involving central government organisations, private sector companies and third sector organisations by 2022. The strategy also calls for formal collaborative partnership arrangements with institutions representing the ICT industry, although these are scoped broadly and may or may not include AI-related collaboration. In addition, Brazil has announced its intention to establish eight applied AI research centres to be co-funded by the government and private sectors, hosted by established academic institutions, and focused on health, agriculture, industry and smart cities.[23] Finally, the strategy calls for cross-sector partnerships to host "datathons" and hackathons in order to help identify solutions for public sector challenges, which may be focused on or otherwise result in AI-enabled solutions.

- Chile's Data Observatory (DO) is a public-private partnership "created to help close gaps in technological development and increase the role of [the] country in the fourth industrial revolution". The Observatory represents one of the strongest public-private partnerships in the region (see Box 6.8). The country's AI strategy and action plan also calls for the promotion of public-private partnerships for infrastructure and the development of good practices for the ethical use of AI.

- In Colombia, a Digital Government Directorate has been created under MinTIC to "promote public-private partnerships for IT adoption processes", among other things. Also in Colombia, the CAOBA Alliance is the "first public-private partnership that promotes Big Data and data analytics in Colombia." The Alliance consists of 11 representatives from the country's academic, public and private sectors (OECD, 2018[10]). Resulting outputs have not focused on AI, but this appears feasible, as data and analytics constitute the foundation of many AI systems. Recent OECD work found that "new approaches to public-private partnerships related to ICT must be developed to create and develop new business models and define and provide innovative digital services" (OECD, 2018[10]).

- As touched on earlier in this report, Costa Rica is developing a National Laboratory for Artificial Intelligence (LaNIA) specifically aimed at searching for cross-sector solutions to national problems with the support of AI. Its goals will be to create an ecosystem, strengthen trust, and promote research and education in AI.

- Ecuador is exploring public-private partnerships for an AI-enabled identity programme, according to officials interviewed by the OECD.

- In 2020, Jamaica's GOJ CodeFest hackathon brought together the public sector and academia to design and develop solutions in a number of areas, yielding winning solutions that use basic AI functionality.[24]

- Previous OECD work has documented Panama's willingness to further its role in government innovation through a multi-stakeholder approach and partnering with academic and private sectors (OECD, 2019[11]). This effort is not related to AI, but is indicative of a solid foundation in this area that could also serve AI efforts well. This work also identified additional opportunities for research, education and private sectors, demonstrating additional room for growth.

- As touched on earlier, Paraguay's InnovandoPy initiative seeks to identify innovative technology ideas, inspire and motivate young entrepreneurs, bring together public and private sector actors, promote collaboration in digital projects, and promote entrepreneurship in the country. Its activities include a start-up accelerator, hackathons for citizen-centred apps and "ideathons" for generating innovative ideas (see Box 5.10).

- Over the last few years, Peru has taken strategic steps to build connections across sectors to promote collaboration, partnerships and the co-creation of public services. Its recent draft national AI strategy calls for the promotion of public-private partnerships (and procurement processes, as relevant to the next section) geared towards the installation of AI-relevant infrastructure of benefit to all sectors. This was preceded by the passing of the Government and Digital Transformation Secretariat resolution 003-2019-PcM/Segdi[25] to strengthen ties across sectors, and the creation of a Digital Transformation Lab, with support from CAF, to build a collaborative ecosystem. Peru has also passed a Regulation of the Digital Government Law in 2021 that seeks to further promote cross-sector collaboration.[26] As yet, these efforts do not appear to have produced AI partnerships, but they can serve as a solid foundation in the future. Finally, the country has developed an excellent practice for the development of key strategies through an open co-design process. For example, the National Digital Transformation Policy and Strategy was co-designed with the public and private sectors, civil society, academia and the public.[27]

Box 6.8. Data Observatory (Chile)

As described in the Inter-American Development Bank (IDB) report *Artificial Intelligence for Social Good in Latin American and the* Caribbean, Chile's Data Observatory (DO) is a "non-profit organization created in 2020 to leverage the benefit obtained from data on the environment and other unique public data that are generated within the country and have global value". The report further explains that the "Data Observatory co-ordinates academia, the public sector, industry and civil society in global partnerships so as to generate useful solutions and capabilities in data science and related technologies that yield returns to the different sectors of the economy. Specifically, the observatory centres on four lines of work:

1. Collect datasets of global value and make them available to the public in an open manner.

2. Design and implement solutions to acquire, analyse, explore, visualise and offer access to these datasets and maximise their full exploitation.

3. Contribute to the development of talent related to the implementation of these actions, and provide hands-on learning based on materials and courses.

4. Invest in creating networks that facilitate technology transfer and associativity among people who work in different fields but who share functional similarities in terms of their work with data.


> One of the observatory's most noteworthy projects aims is to harness AI to explore solutions for phenomena related to climate change such as the extreme events produced by desertification and sea level changes, among others."
>
> *Source*: (Gómez Mont et al., 2020[12]), www.dataobservatory.net and https://oecd.ai/en/dashboards/policy-initiatives/http:%2F%2Faipo.oecd.org%2F2021-data-policyInitiatives-26733.

While these efforts demonstrate growing capacity to leverage external expertise through cross-sector collaboration, most represent early-stage commitments (rather than fully implemented approaches), ad-hoc solutions, relatively passive consultations, or efforts that are broader than, or not related to, AI. With the potential exception of Chile's Data Observatory, the OECD was unable to identify systems-wide approaches that bring together multiple sectors to collaborate continuously on AI efforts.[28] Such approaches scoped for AI are fairly new worldwide, so the current status among LAC governments matches expectations and, overall, constitutes a positive trend for the region. The United Kingdom's Alan Turing Institute and its Public Policy Programme represent perhaps the most successful systematic mechanism for cross-sector partnership and collaboration in this regard, with a specific focus on AI in the public sector.[29]

In addition to cross-sector collaboration and partnerships, another way that governments can leverage external expertise is through **public procurement**.[30] While building up in-house AI expertise can be challenging, as discussed above, so can obtaining expertise externally, due to cumbersome procurement processes. In the LAC region, only a handful of countries have an ICT procurement strategy in place (Figure 6.9). Such strategies are broader than just AI, but they can put in place positive practices and purchasing arrangements that can help leverage external expertise in many digital government domains, including emerging technology.[31]

Figure 6.9. Existence of an ICT procurement strategy in LAC countries
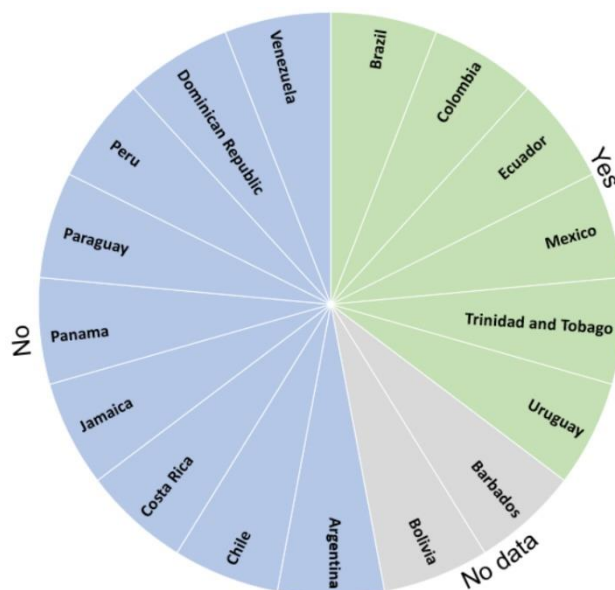
Source: (OECD, 2019[11]).

Given the relative uncertainty of the field of Artificial Intelligence and the lack of existing mature markets for AI in the public sector, procuring expertise and services is not as simple as obtaining expertise related

to more traditional or known technologies. Accordingly, governments may need to develop flexible, agile procurement processes (and subsequent implementation processes) tailored for AI needs, and build longer-term, collaborative relationships with commissioned delivery partners (OECD, 2017[13]). They may also wish to adopt innovative procurement approaches to foster innovation and the creation of deep and competitive markets for AI goods and services.

Among LAC governments, there do not appear to be any mechanisms or processes tailored to procuring expertise and services for AI in the public sector. Such procurement mechanisms and processes are worthy of exploration, and LAC governments could look at the strong example provided by Canada's Source List for inspiration (see Box 6.9). Portugal's Programme in Data Science and Artificial Intelligence in Public Administration represents another positive example that brings together the concepts of public cross-sector partnerships and public procurement (Box 6.10). While these have not resulted in AI-specific approaches, several countries have developed other procurement elements that could support successful procurement related to AI in the public sector:

- Brazil's national digital government strategy includes a number of objectives to create mechanisms to centralise purchases of ICT technologies, including a virtual marketplace for digital solutions. Although not explicitly stated, such mechanisms could allow for centralised vetting and purchases of AI expertise and solutions, an approach that has proven successful in other countries.

- One of the key actions of Chile's AI strategy and action plan is the modernisation of public procurement for AI. The country has also issued a new Public Procurement Innovation Directive (see Box 6.11). While not specific to AI, the Directive lays out solid mechanisms and processes that can facilitate innovative approaches to securing all sorts of goods, expertise and services, including those related to AI.

- Trinidad and Tobago's National Information and Communication Technology Company Limited (iGovTT), a public company that serves as the implementation arm of the Ministry of Public Administration and Digital Transformation, provides public sector organisations with an interesting procurement-as-a-service model that provides expert assistance to agencies to facilitate successful procurement processes.[32]

- Uruguay has issued a presidential decree that puts in place special contracting regimes and procedures in order to stimulate innovative technological developments in the public sector.[33]

Box 6.9. The Government of Canada's AI Source List for the promotion of innovative procurement

The Government of Canada has created an AI Source List with 73 pre-approved suppliers "to provide Canada with responsible and effective AI services, solutions and products". The framework allows government agencies to expedite procurement from firms that have demonstrated their capability to provide quality AI goods and services.

The framework requires suppliers to demonstrate competence in AI ethics, as well as implementation and access to talent. Firms that responded to the "Invitation to Qualify" had to prove to an interdisciplinary panel that they satisfied these requirements. The framework has three bands with escalating requirements. The lowest band has less stringent requirements, making it easier for small start-ups to qualify, thereby driving innovation and creating a deeper market.

The framework supports mission-driven and iterative innovation by allowing multiple firms to be commissioned to develop early-stage services to address a problem. This enables effective information sharing and an agile approach to mitigate the uncertainty of potentially disruptive approaches.

The process of establishing and maintaining this list of AI service providers is also an important way for the Government of Canada to build longer-term relationships with private companies. This dialogue

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facilitates the development of shared expectations and mutual understanding about potential challenges relevant to public sector organisations.

Source: https://oecd.ai/en/dashboards/policy-initiatives/http:%2F%2Faipo.oecd.org%2F2021-data-policyInitiatives-24197, www.tpsgc-pwgsc.gc.ca/app-acq/cral-sarc/iava-aipv-eng.html, https://buyandsell.gc.ca/procurement-data/tender-notice/PW-EE-017-34526 and https://buyandsell.gc.ca/cds/public/2018/09/21/5e886991ecc74498b76e3c59a6777cb6/ABES.PROD.PW__EE.B017.E33817.EBSU001.PDF

Box 6.10. Programme in Data Science and Artificial Intelligence in Public Administration (Portugal)

As part of the Portugal INCoDe.2030 initiative (see Box 5.12), the country's Foundation for Science and Technology developed the Programme in Data Science and Artificial Intelligence in Public Administration to support new data science and AI innovation projects that involve partnerships between public administration and non-business scientific institutions. The objective of the programme is to leverage the large amounts of data available to the public administration in order to produce scientific knowledge that can assist evidence-based decision making and public policy making.

Portugal allocated EUR 3.5 million for the initiative and solicited proposals for projects. All proposals were required to be joint in nature, including at least one scientific institution and one public sector institution. Qualifying projects needed to have a duration of 24-36 months, and each could receive a maximum of EUR 300 000.

The government's Administration of Modernisation (AMA) also issues a list of topics of particular interest for proposals, including fraud detection, analysis of mobility patterns, forecasting emergency and medical services, optimisation of digital services, chatbots for local administrations and municipal self-service dashboards, among others. AI projects that have received awards include the use of AI to enhance medical skin scanning (EUR 299 000), forecasting hospital emergency room usage (EUR 283 000) and a land feature recognition system (EUR 125 000).

Source: https://oecd.ai/dashboards/policy-initiatives/2019-data-policyInitiatives-24551,
www.fct.pt/apoios/projectos/concursos/datascience/2018/index.phtml.pt and
www.fct.pt/apoios/projectos/consulta/areas.phtml.pt?idElemConcurso=12344.

Box 6.11. Public Procurement Innovation Directive (Chile)

The Public Procurement Innovation Directive was created by ChileCompra in co-ordination with LabGob and the Ministry of Economy, Development and Tourism, in order to help public servants leverage more innovative and user-centred approaches to public procurement, and to more effectively and efficiently meet the needs and demands for new products, goods or services. Its overarching goals are to incorporate innovation throughout the procurement process, better allow public servants to leverage public procurement as a strategic tool to solve real problems, and to better meet the needs and expectations of users.

To achieve these aims, the Directive provides practical guidance, recommendations and tools in line with five phases:

1. **Plan**. Identify innovative public purchasing opportunities.

2. **Explore**. Describe the initial needs, convene a work team, listen, empathise and look at the environment.

3. **Define.** Reformulate the purchase need, manage risk and define evaluation criteria.

4. **Invite and adjudicate.** Evaluate the proposals received and make selection(s).

5. **Afterwards:** Reflect, replicate.

The Directive underwent public consultation including with those mostly likely to be impacted. Some 221 responses were received and evaluated prior to finalisation of the Directive.

Source: www.chilecompra.cl/wp-content/uploads/2018/08/20180614-DIRECTIVA-CPI.pdf

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Many LAC governments demonstrate a high level of commitment to developing efficient and effective systems for public procurement of external digital expertise, goods and services in ways that are less clearly related to or otherwise supportive of AI. For instance, a number of LAC countries have developed national procurement strategies, centralised procurements of commodity solutions, put in place review systems to vet large or complex purchases, added procurement competencies to their staff competency frameworks, leveraged economies of scale to drive down prices and issued other guidance to enhance ICT commissioning. Such efforts fall largely outside the scope of this AI review; however, the forthcoming report *Going Digital: The State of Digital Government in Latin America* will discuss these issues in depth.

Infrastructure

Finally, governments will need to consider their current technical infrastructure needs against their ambitions, and ensure that the necessary modern infrastructure is in place to allow progress in the exploration of AI. Legacy technologies and infrastructures are often insufficient for disruptive technologies and techniques, such as Machine Learning, and the OECD has previously noted that governments in many cases struggle to adopt proven technologies such as cloud computing, which are important for AI progress (Berryhill et al., 2019[1]).

Figure 6.10. LAC regional infrastructure capacities for AI in the public sector
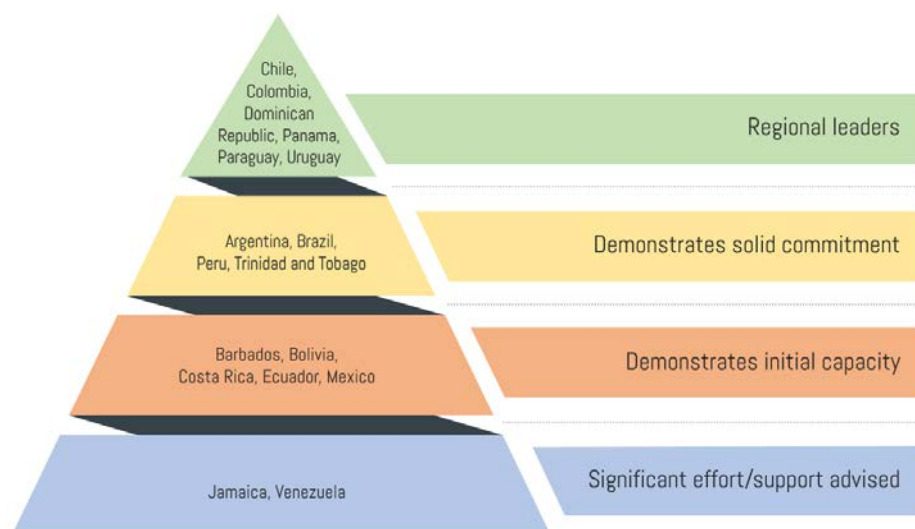
The topic of infrastructure and overcoming legacy technology is immense, and extends far beyond AI. While a comprehensive review of infrastructure capacities among LAC governments is beyond the scope of this report, the OECD has identified surface summary-level information on public sector infrastructure capacities and a number of specific instances in which LAC governments are positioning themselves to ensure the necessary infrastructure exists to explore and implement AI-driven solutions (Table 6.3).

Table 6.3. Existence of infrastructure available to central government institutions

	Shared ICT infrastructure (e.g. shared data centres)	Shared cloud services	Common data architecture or infrastructure	Common interoperability framework	Shared technology services (e.g. joint software development, common platforms)
Argentina	✓	✓	✓	✓	✓
Barbados	✓				✓
Brazil	✓	✓	✓	✓	✓
Chile				✓	✓
Colombia	✓	✓	✓	✓	✓
Costa Rica	✓	✓			
Dominican Republic	✓	✓	✓	✓	
Ecuador	✓	✓	✓	✓	✓
Jamaica	✓				✓
Panama	✓	✓	✓	✓	✓
Paraguay	✓	✓	✓	✓	✓
Peru		✓	✓	✓	
Uruguay	✓	✓	✓	✓	✓

Note: Data are not available for Bolivia, Mexico, Trinidad, and Tobago and Venezuela due to a lack of survey responses.
Source: OECD LAC Digital Government Agency Survey (2020), follow-up with government officials.

Such identified initiatives include the following:

- As a strategic objective for 2021, Argentina is investing USD 5.8 million (equivalent) to create a national public cloud infrastructure in order to help consolidate data from across the state and

allow the public sector to become more agile.[34] Public sector organisations will be able to self-manage their own computing, connectivity and storage use through the cloud.

- The Public Sector Modernisation Programme in Barbados has committed to improving core ICT infrastructure and upgrading its central data centre to better equip the government to support new technologies and approaches.[35] The country is also in the process of implementing the X-Road,[36] a free and open source data exchange layer originally created by the Government of Estonia and successfully replicated by a number of governments around the world.

- Brazil's national digital government strategy includes initiatives to optimise the infrastructure of at least 30 government data centres and migrate services from no less than 20 agencies to the cloud by 2022. This is a step in the right direction, as previous OECD work has found that the absence of important key enablers, such as shared infrastructure like shared data centres, can lead to the duplication of public efforts for the development of a digital government (OECD, 2018[14]). The country's efforts in this area are still fairly new, however, and the government will need to maintain a close focus on implementation. As such efforts are strengthened, Brazil demonstrates strong promise to become a regional leader in interoperability and cross-border collaboration. Given the political and economic relevance of Brazil in the region, as well as its experience in promoting interoperability across different federation levels, previous OECD work has recommended that the country may be well placed to lead and actively support other LAC countries' efforts in the area of cross-border service delivery.

- Bolivia has put in place an interoperability platform to enable data sharing across public sector institutions.[37] It has also issued guidelines and documented good practices related to implementing and maintaining data centres,[38] though these tend to deal with basic operational considerations rather than ensuring the existence of capabilities to support modern and emerging technologies across government in an optimised manner.

- The Government of Chile is continuing to expand and modernise digital infrastructure, laying the foundations for the digital transformation of the economy and society. The country's new national AI strategy considers infrastructure to be a key enabling factor for AI, and incorporates an objective to convert Chile into a global hub for technical infrastructure for the southern hemisphere. It also calls for the creation of public-private partnerships to ensure that the necessary infrastructure for AI is in place. The Chilean procurement authority (ChileCompra) has developed a digital marketplace with framework agreements that aim to simplify the process of ICT acquisition for some forms of procurement, including data centres (OECD, 2019[15]). In addition, as a relevant part of its state modernisation efforts, Chile has been working on a number of digital infrastructure projects, including an interoperability framework and platform that fosters data sharing within the administration (OECD, 2019[15]). The adoption of Chile's interoperability infrastructure is advancing slowly, however, and is not yet widely used (OECD, 2020[8]), with officials interviewed by the OECD citing interoperability challenges, but it appears to have solid potential for growth if prioritised by the government.

- Colombia has established framework purchase agreements with numerous vendors and has developed an impressive centralised "virtual store" that allows for public sector organisations to easily purchase a variety of goods and services, including for infrastructure, such as public and private cloud services.[39] This appears to represent solid progress, as previous OECD work found little evidence of a culture of shared resources and infrastructure, or the promotion of integrated digital government solutions (OECD, 2018[10]). A more mature version of such a store could function similarly to the United Kingdom's Digital Marketplace (see Box 6.12), which has proven highly successful. Indeed, Colombia is currently developing a conceptualisation document for the implementation of data marketplaces.[40]

- Costa Rica's Digital Technologies National Code[41] provides guidance on using cloud services; however, the OECD could find no evidence that the country has built out or otherwise provides for cloud infrastructure. It appears that this guidance is perhaps intended to guide public sector use of third-party cloud services.

- The Dominican Republic has developed a government-wide private cloud (OPTICLOUD)[42] for use by public sector organisations. The country has also developed a state data centre[43] that allows for the protection and processing of information from public institutions with a high level of security.

- Ecuador has developed an interoperability platform[44] that enables public sector institutions to share and exchange data in interoperable forms across systems. The platform is rooted in Ecuador's interoperability law which compels public sector organisations to take steps to ensure interoperability of data. In 2020, the country initiated a systems migration plan[45] to consolidate public sector data into a shared central data centre. However, in an interview with the OECD, Ecuador officials said that this centre is still conceptual and that rules and processes for its development need to be determined prior to implementation.

- Through its National Development Plan[46] (2019-2024), Mexico is pushing for greater efficiency and momentum in the use of shared ICT infrastructure.

- Panama has developed common government private cloud infrastructure for use across government.[47] In a fact-finding meeting with the OECD, Panama officials stated that one of their top priorities now is interoperability and alignment of data processes, and that an interoperability platform has been developed with step-by-step guidance for public organisations on how to access the platform. At present, ten public entities are already using the platform. Previous OECD work also identified that infrastructure associated with storing and managing data is a strength in Panama's public sector (OECD, 2019[11]).

- Paraguay's NUBE PY (Paraguay Cloud)[48] private cloud initiative provides infrastructure-as-a-service (IaaS) and a pool of resources to public sector organisations across the county. The country also has an Information Exchange System[49] interoperability platform to help public sector institutions share interoperable data based on standards set by government.

- As touched on in the previous section, Peru's draft national AI strategy calls for the creation of public-private partnerships to ensure the installation of necessary AI-relevant infrastructure (data centres and the cloud) of benefit to all sectors. In addition, since 2011, Peru has had a National Interoperability Platform[50] that allows for data exchange across public sector organisations. The country's 2018 Digital Government Law[51] allowed for advances in this area through the creation of relevant digital service and data interoperability infrastructure at the institutional level (OECD, 2019[16]). Also in 2018, Peru's Supreme Decree 033-2018-PCM launched a new GOB.PE portal[52] and mandated that digital services (at present and in the future) be digitalised, with all supporting systems, infrastructure and data participating in the interoperability platform (OECD, 2019[16]).[53] In 2020, through a decree instituting a Digital Trust Framework,[54] the country also committed to building a shared National Data Centre that will allow public servants across the public sector, at the national level, to co-operatively and collaboratively use data across government. The Data Centre is also intended to co-ordinate actions with public entities, academia, civil society and the private sector.

- Trinidad and Tobago has developed a solid Cloud Computing Consideration Policy[55] to promote wider adoption of the cloud in a manner that meets national rules and standards. In addition to helping clear a path to procurement of cloud services from the public sector, the policy also commits to developing a government-wide National Hybrid Cloud (GovNeTT NG) for instances in which public sector organisation needs a higher set of controls than available through public cloud

offerings from industry. In addition, iGovTT, a public company for digital government implementation, provides a centralised data centre access and administration services.[56]

- Uruguay has designed and developed the Cloud of the Presidency Office, which offers infrastructure/platform/software as a service (IaaS, PaaS and SaaS) to all its agencies. Currently, the cloud host more than 3 500 virtual machines. In 2018, working together with the state-owned telecommunications company (ANTEL), a government cloud service was launched to provide services to the public sector (Ubaldi et al., 2019[6]).

Box 6.12. The United Kingdom's Digital Marketplace

The United Kingdom has been developing ways to reframe its existing approaches to contracting and supplier relationships, in particular regarding access to cloud-based services and the skills and capabilities required for digital transformation.

Two units within the Cabinet Office, the Government Digital Service and the Crown Commercial Service, have worked together to redesign procurement frameworks (G-Cloud and Digital Outcomes and Specialists) in order to simplify the application process for suppliers, and improve the quality of resources available to government buyers. These interactions are handled through the government's Digital Marketplace.

The Digital Marketplace provides government buyers with access to framework agreements with suppliers from which public sector organisations can buy without launching a tender or competitive procurement process.

For the G-Cloud framework the services include the following:

- **Infrastructure as a service (IaaS**) refers to the provisioning of fundamental computing services (processing, storage etc.) for the user to run software.

- **Platform as a service (PaaS**) relates to the provisioning of platform services to enable a user to deploy user-built or acquired applications.

- **Software as a service (SaaS)** concerns the provisioning of a provider's software as a cloud service.

- **SCS – Specialist Cloud Services** typically refers to consultancy in the cloud domain. The Digital Marketplace frameworks are refreshed every six months to ensure public institutions have access to the latest innovations available whether from large, established suppliers or new, SMEs entering the market for the first time.

Furthermore, the Digital Marketplace allows public institutions to access suppliers who can help them design, build and deliver digital products using an agile approach through the Digital Outcomes and Specialists (DOS) dynamic framework. To become part of the DOS supplier list, suppliers must provide either outcome-based services (covering user experience and design, performance analysis and data, security, service delivery, service development, support and operations, testing and auditing or user research) or individual capabilities in one of these areas.

Source: www.gov.uk/government/collections/digital-marketplace-buyers-and-suppliers-information (OECD, 2019[15]).

Overall, consideration for appropriate infrastructure to support AI and other modern technological initiatives appears to be a relative strength in the LAC region. Many implemented programmes provide infrastructure that can serve as a foundation for AI in the public sector, while a number of solutions that governments have committed to build out in the near future have tremendous potential. It is important to note, however,

that successful adoption of cloud computing and other infrastructure solutions can only take place with careful consideration of data governance and ownership arrangements, exit clauses and ease of supplier change (OECD, 2019[15]). In addition, having infrastructure in place is only valuable if the underlying legal and regulatory framework fosters its use for AI. One of the common themes from the AI Latin American SumMIT was that antiquated laws hindered access to and use of this infrastructure for AI (Anllo et al., 2021).[57]

As an additional consideration, it is important to note that this section focuses on types of infrastructure needed for AI for public sector innovation and transformation, and not necessarily for infrastructure to support broader economic and societal success in AI. For example, one theme that emerged from the SumMIT was that connectivity infrastructure to close the digital divide is critical to national and regional progress in AI (Anllo et al., 2021), though such infrastructure is not strictly related to the scope of this review. Finally, this section has focused mainly on the availability of AI-supporting infrastructure at the central government level, with less consideration for sub-national levels of government. Some of these items are touched on earlier in this report, and will be discussed in more depth in the forthcoming report *Going Digital: The State of Digital Government in Latin America.*

References

Agrawal, A., J. Gans and A. Golbfarb (2018), *Prediction Machines: The Simple Economics of Artificial Intelligence*, Harvard Review Press. [9]

Berryhill, J. et al. (2019), "Hello, World: Artificial intelligence and its use in the public sector", *OECD Working Papers on Public Governance*, No. 36, OECD Publishing, Paris, https://dx.doi.org/10.1787/726fd39d-en. [1]

Gómez Mont, C. et al. (2020), *Artificial Intelligence for Social Good in Latin America and the Caribbean*, https://publications.iadb.org/publications/english/document/Artificial-Intelligence-for-Social-Good-in-Latin-America-and-the-Caribbean-The-Regional-Landscape-and-12-Country-Snapshots.pdf. [12]

Government of Argentina (2019), *Plan Nacional de Inteligencia Artificial*, https://oecd-opsi.org/wp-content/uploads/2021/02/Argentina-National-AI-Strategy.pdf. [7]

OECD (2021), "The OECD Framework for digital talent and skills in the public sector", *OECD Working Papers on Public Governance*, No. 45, OECD Publishing, Paris, https://dx.doi.org/10.1787/4e7c3f58-en. [3]

OECD (2020), *Digital Government in Chile – Improving Public Service Design and Delivery*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/b94582e8-en. [8]

OECD (2020), *Embracing Innovation in Government: Global Trends 2020 - Innovative Responses to the COVID-19 Crisis*, OECD Publishing, https://trends.oecd-opsi.org/trend-reports/innovative-covid-19-solutions/. [2]

OECD (2020), *Embracing Innovation in Government: Global Trends 2020 - Seamless Government*, OECD Publishing, https://trends.oecd-opsi.org/trend-reports/seamless-government. [17]

OECD (2019), *Digital Government in Chile – A Strategy to Enable Digital Transformation*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/f77157e4-en. [15]

OECD (2019), *Digital Government in Peru: Working Closely with Citizens*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/0c1eb85b-en. [16]

OECD (2019), *Digital Government Review of Argentina: Accelerating the Digitalisation of the Public Sector*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/354732cc-en. [4]

OECD (2019), *Digital Government Review of Panama: Enhancing the Digital Transformation of the Public Sector*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/615a4180-en. [11]

OECD (2019), *The Path to Becoming a Data-Driven Public Sector*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/059814a7-en. [5]

OECD (2018), *Digital Government Review of Brazil: Towards the Digital Transformation of the Public Sector*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264307636-en. [14]

OECD (2018), *Digital Government Review of Colombia: Towards a Citizen-Driven Public Sector*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264291867-en. [10]

OECD (2017), *Public Procurement for Innovation: Good Practices and Strategies*, OECD Public Governance Reviews, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264265820-en. [13]

Ubaldi, B. et al. (2019), "State of the art in the use of emerging technologies in the public sector", *OECD Working Papers on Public Governance*, No. 31, OECD Publishing, Paris, https://dx.doi.org/10.1787/932780bc-en. [6]

Notes

[1] Cloud computing refers to Internet-based remote computing that provides users with on-demand access to infrastructure (data centres/storage), services and applications. The economies of scale achieved through the cloud allow organisations to avoid costly infrastructure development and focus on core business operations while access storage and services at a cost tailored to their workload and needs.

[2] https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/3975.pdf.

[3] See https://minciencias.gov.co/ocad_fctei/fondo-fctei-sgr/que-es.

[4] www.conatel.gob.ve/ley-de-infogobierno.

5 For key themes in innovative efforts to upskill citizens and public servants, see the OECD Observatory of Public Sector Innovation (OPSI) report *Embracing Innovation in Government: Global Trends 2021 – Upskilling and Investing in People* (https://trends.oecd-opsi.org/trend-reports/upskilling-and-investing-in-people).

6 See https://capacitacion.inap.gob.ar/cursos for a full list of courses.

7 http://training.gov.bb.

8 https://tridentlearning-m2.remote-learner.net.

9 www.enap.gov.br.

10 See www.escolavirtual.gov.br/curso/270, https://suap.enap.gov.br/portaldoaluno/curso/917, https://suap.enap.gov.br/portaldoaluno/curso/862, https://suap.enap.gov.br/portaldoaluno/curso/460 and www.escolavirtual.gov.br/curso/153.

11 www.datos.gov.co/Ciencia-Tecnolog-a-e-Innovaci-n/Capacitaciones-Iniciativa-Datos-Abiertos-de-Colomb/g4ch-dnpp/data

12 www.catalizadores.gov.co/655/w3-channel.html.

13 www.misiontic2022.gov.co/portal.

14 See www.gtai.de/resource/blob/214860/d0599cb76af4c3f5c85df44bfff72149/pro202001315003-data.pdf.

15 See https://mintic.gov.co/portal/inicio/Sala-de-Prensa/Noticias/106989:Mas-de-25-000-colombianos-podran-formarse-gratis-en-Inteligencia-Artificial-y-habilidades-para-la-transformacion-digital-gracias-a-MinTIC.

16 https://portal.icetex.gov.co/Portal/Home/HomeEstudiante/fondos-en-administracion-Listado/convocatoria-transformacion-digital-2020-1.

17 See the OECD report *Leadership for a High Performing Civil Service* for a discussion specific to leadership capabilities that are necessary to respond to complex policy challenges. While not specifically digital skills, they serve as a foundation for leadership capacity that benefits many cross-cutting fields and approaches. See www.oecd-ilibrary.org/governance/leadership-for-a-high-performing-civil-service_ed8235c8-en.

18 See https://oecd-opsi.org/wp-content/uploads/2019/11/AI-Report-Online.pdf (p. 126).

19 www.gub.uy/participacionciudadana/consultapublica.

20 www.minciencia.gob.cl/noticias/ministerio-de-ciencia-abre-consulta-publica-para-la-politica-nacional-de-inteligencia-artificial.

21 https://bit.ly/3sPyvOx, www.presidencia.go.cr/comunicados/tag/dialogo.

22 www.argentina.gob.ar/noticias/hackaton-agro-todos-juntos-para-mejorar-la-produccion-agropecuaria-y-pesquera and www.argentina.gob.ar/noticias/nuestro-primer-hackaton.

23 https://oecd.ai/dashboards/policy-initiatives/2019-data-policyInitiatives-26771.

24 See http://gojcodefest.com and https://jis.gov.jm/educational-solution-takes-top-prize-at-codefest-2020.

25 www.gob.pe/institucion/pcm/normas-legales/308608-003-2019-pcm-segdi.

26 www.gob.pe/13326-reglamento-de-la-ley-de-gobierno-digital.

27 www.gob.pe/10522-estrategias-de-co-diseno-para-la-politica-y-estrategia-nacional-de-transformacion-digital.

28 The OECD Observatory of Public Sector Innovation (OPSI) has identified a growing trend in governments building out systemic "collaborative infrastructure" to support cross-government, cross-sector and international collaboration. For more details and case studies, see the 2020 report *Embracing Innovation in Government: Global Trends 2020 – Seamless Government* (https://trends.oecd-opsi.org/trend-reports/seamless-government) (OECD, 2020[17]).

29 See the in-depth case study on the Public Policy Programme in the 2019 OECD report *Hello, World: Artificial intelligence and its use in the public sector* (https://oe.cd/helloworld, available in English and Spanish).

30 The OECD, through its Working Party of Senior Digital Government Officials (E-Leaders) (www.oecd.org/governance/eleaders), has developed the ICT Commissioning Playbook. It focuses on ICT procurement reform and its part in the wider digital transformation of the public sector in countries around the world. The goal of the Playbook is to show how traditional procurement can evolve towards agile procurement. While not exclusive to AI, such principles and practices can help support public servants in designing and executing successful AI procurements. See https://playbook-ict-procurement.herokuapp.com.

31 In discussing public procurement related to AI, it is important to distinguish (1) embedding AI in procurement processes (e.g. the automation of tasks, identifying corruption, etc.) and (2) procuring AI expertise to support the adoption of AI in the public sector. This section focuses specifically on the second of these concerns. The OECD has issued a highly relevant report on *Public Procurement for Innovation: Good Practices and Strategies* to provide guidance to help governments leverage the power of public procurement to support innovation (OECD, 2017[13]).

32 www.igovtt.tt/our-services/#service-4.

33 www.impo.com.uy/bases/decretos/191-2019.

34 See www.telam.com.ar/notas/202101/540302-el-gobierno-nacional-destina-500-millones-para-crear-la-nube-publica-de-arsat.html.

35 See www.gtai.de/resource/blob/214860/d0599cb76af4c3f5c85df44bfff72149/pro202001315003-data.pdf.

36 https://x-road.global.

37 https://bit.ly/3I2ddBD.

38 www.ctic.gob.bo/wp-content/uploads/2019/10/LINEAMIENTOS-Y-BUENAS-PRACTICAS.pdf.

39 www.colombiacompra.gov.co/tienda-virtual-del-estado-colombiano/tecnologia.

40 https://dapre.presidencia.gov.co/TD/181220%20Econom%C3%ADa%20de%20Intercambio%20de%20Datos.pdf.

41 www.micit.go.cr/sites/default/files/cntd_v2020-1.0_-_firmado_digitalmente.pdf.

42 https://optic.gob.do/servicio/nube-computacional-gubernamental-opticloud.

43 http://dominicana.gob.do/index.php/politicas/2014-12-16-20-56-34/politicas-para-el-buen-gobierno/centro-de-datos-del-estado.

44 www.gobiernoelectronico.gob.ec/interoperabilidad-gubernamental.

45 www.gobiernoelectronico.gob.ec/wp-content/uploads/2020/02/REGISTRO-OFICIAL-PLAN-DE-MIGRACION.pdf.

46 www.proyectosmexico.gob.mx/en/how-mexican-infrastructure/national-planning.

47 https://aig.gob.pa/descargas/2019/06/Nube_Computacional.pdf?csrt=12274800530103940880.

48 www.mitic.gov.py/viceministerios/tecnologias-de-la-informacion-y-comunicacion/servicios/nube.

49 www.mitic.gov.py/viceministerios/tecnologias-de-la-informacion-y-comunicacion/servicios/sistema-de-intercambio-de-informacion.

50 www.gob.pe/741-plataforma-de-interoperabilidad-del-estado.

51 https://busquedas.elperuano.pe/normaslegales/decreto-legislativo-que-aprueba-la-ley-de-gobierno-digital-decreto-legislativo-n-1412-1691026-1.
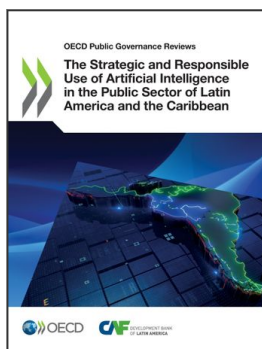
52 www.gob.pe.

[53] See also www.gob.pe/institucion/pcm/normas-legales/108986-033-2018-pcm.

[54] www.gob.pe/institucion/anpd/normas-legales/2018534-07-2020.

[55] https://data.gov.tt/fr/dataset/draft-cloud-computing-policy.

[56] www.igovtt.tt/our-services/#service-3.

[57] As discussed in the closing remarks, available at www.youtube.com/watch?v=tzf14FXajCc.