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Unit.D2 (Interoperability Unit)

Open Source Software Country Intelligence Report

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Executive Summary

The Argentine government is very active in the domain of public sector innovation. The Secretariat of Public Innovation (*Secretaría de Innovación Pública*)[1] has several organs which develop public sector open source software (OSS) policies and platforms, including the National Office for Information Technology (*Oficina Nacional de Tecnologías de Información*)[2], the Undersecretariat for Open Government and Digital Nation (*Subsecretaria de Gobierno Abierto y País Digital*)[3] and the Undersecretariat of Administrative Innovation (*Subsecretaria de Innovación Administrativa*)[4]. The government is committed to a policy of open government and using OSS participatory democracy solutions to achieve this aim, the source code of which is published on government's official GitHub repository[5].

The government's commitment to the cause of OSS is particularly clear following the approval of the Technological Decalogue[6] in 2018. The Decalogue mandates that all national public sector bodies must favour open source technologies to reduce costs and avoid dependence on suppliers.

In addition to governmental actors, there is a rich variety of strategic players working to raise awareness on and increase the use of OSS, including GNU Solidario[7], Democracia en Red[8], GeoLibres[9] and CAdESol[10]. They play an important role in developing solutions for public sector actors and increasing public sector knowledge about the benefits of OSS through various initiatives. A key example is Democracia en Red's development of DemocraciaOS[11], a participatory platform used in several Argentine public administrations, and GNU Solidario's work on eHealth projects in hospitals[12]:

Actors

This section presents the key governmental bodies that are responsible for setting OSS policies and the main strategic players that work together with the government at all levels to raise awareness on OSS.

Policy makers

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[1] https://www.argentina.gob.ar/jefatura/innovacion-publica
[2] https://www.argentina.gob.ar/jefatura/innovacion-publica/onti
[3] https://www.argentina.gob.ar/jefatura/innovacion-publica/gobierno-abierto-y-pais-digital
[4] https://www.argentina.gob.ar/jefatura/innovacion-publica/administrativa
[5] https://github.com/argob
[6] https://www.argentina.gob.ar/sites/default/files/decalogo_tecnologico_onti_version_1_1_0.pdf
[7] https://www.gnusolidario.org/
[8] https://democraciaenred.org/
[9] https://dev.argentina.osgeo.org/about/
[10] https://cadesol.org.ar/about/
[11] https://democraciaos.org/es/
[12] https://www.gnusolidario.org/

- The Secretariat of Public Innovation (*Secretaría de Innovación Pública*)[13], located within the Chief of Cabinet of Ministers of the Argentine government (*Jefatura de Gabinete de Ministros*)[14], is responsible for ensuring inclusion and equality in Argentina through governmental transparency and by guaranteeing connectivity, access to information and new technologies. The Secretariat intervenes in policies pertaining to the use of OSS in the Argentine public administration.

- The National Office for Information Technology (*Oficina Nacional de Tecnologías de Información*)[15] (ONTI), located within the Secretariat of Public Innovation, is responsible for directing the formulation of policies and implementation of the technological development and innovation process for the transformation and innovation of the Argentine state, as well as promoting the integration of new technologies, their compatibility and interoperability. ONTI has published a Code of Good Practices in the development of public software[16] and the ONTI Technological Decalogue[17], both of which encourage the use of open technologies in public sector software development, the use of an open and standard licence, and the publication of new source code on the Argentine Catalogue of Public Software[18] or the official repository of the Argentine Republic[19].

- The Undersecretariat for Open Government and Digital Nation (*Subsecretaria de Gobierno Abierto y País Digital*)[20], located within the Secretariat of Public Innovation, develops programmes to guarantee universal access to new technologies, the right to information and new digital skills as part of a comprehensive policy of inclusion. The Undersecretariat is responsible for the Public Consultation platform (*Plataforma de Consulta Pública*)[21], a channel for dialogue and debate that facilitates interaction between citizens and the Argentine government, promotes citizen participation and helps to strengthen democracy. The platform was built using DemocraciaOS[22], an open source online platform designed by Democracia en Red[23] to inform, debate and vote on public proposals.

- The Undersecretariat of Administration Innovation (*Subsecretaria de Innovación Administrativa*) (SSIA) is in charge of the digital transformation of the Argentine public administration. Focusing on technological sovereignty and the evolution towards an open ecosystem of providers, the SSIA develops open source solutions for the management of digital files and official documentation, digital signatures, citizen access and procedures, authentication and

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[13] https://www.argentina.gob.ar/jefatura/innovacion-publica
[14] https://www.argentina.gob.ar/jefatura
[15] https://www.argentina.gob.ar/jefatura/innovacion-publica/onti
[16] https://www.argentina.gob.ar/onti/codigo-de-buenas-practicas-para-el-desarrollo-de-software-publico
[17] https://www.argentina.gob.ar/jefatura/innovacion-publica/ssetic/onti/decalogo-tecnologico
[18] https://www.argentina.gob.ar/onti/software-publico/catalogo
[19] https://github.com/argob
[20] https://www.argentina.gob.ar/jefatura/innovacion-publica/gobierno-abierto-y-pais-digital
[21] https://consultapublica.argentina.gob.ar/
[22] https://democraciaos.org/es/
[23] https://democraciaenred.org/

interoperability services for the entire national public administration As of June 2021, 312,000,000 documents and 29,000,000 files used in some 7107 offices, as well as 4650 types of citizen procedures have been digitalised and this process is continuing rapidly at an average monthly rate of more than 300,000 average digital documents per day. Per month, there are 135,000 different users on average, with daily peaks of 33,000 users per day and up to 14,000 simultaneous users. The solutions developed by the SSIA use a variety of open source tools, including GNU / Linux, Java, Spring, Hibernate, Tomcat, SOLR, REDIS, muleESB, OpenLDAP, ActiveMQ, iText, Openshift, Docker, HAProxy, Keycloak, Kong, AngularJS, ionic, PostgreSQL, RabbitMQ and Vue.js, among others.

- Launched in 2017, the Digital Community AR (*Comunidad Digital AR*)[24] is a community of practice of civil servants committed to improving digital services and the technological infrastructure of the Argentine Republic. It is a multidisciplinary community that includes developers, system administrators, data analysts, designers and team leaders from all ministries and satellite agencies of the public administration. The community is responsible for managing the government's Catalogue of Public Software[25] and the official GitHub repository of the government of the Argentine Republic[26]. The objectives of the community are to encourage collaboration between agencies, promote common solutions to shared problems, disseminate information about useful initiatives for the community, and facilitate the reuse of knowledge and tools. The community is a joint initiative from ONTI, the Academy of Public Policy Design (*Academia de Diseño de Políticas Públicas*)[27] and the Directorate of Systems of the Secretariat of Culture of the Nation (*Dirección de Sistemas de la Secretaría de Cultura de la Nación*)[28].

Strategic players

- Democracia en Red[29] is a civil society organisation comprising activists, software developers and social scientists seeking to increase the openness of public administrations and decision-making processes using open source participatory democracy tools. Founded in Buenos Aires in 2014, they promote the use of OSS and open technologies as an opportunity for the political system to encourage citizen participation. The organisation developed DemocraciaOS[30] in-house, an open source platform that can be used for participatory budgeting, public consultations, co-creation of laws, and goal tracking. They actively promote the use of the citizen participation platform CONSUL[31] and *En Código para el Desarrollo*, an initiative of the Inter-American Development Bank (*Banco Interamericano de Desarrollo)*[32] that provides a

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[24] https://www.argentina.gob.ar/jefatura/innovacion-publica/onti/dit/comunidad-digital-ar
[25] https://www.argentina.gob.ar/onti/software-publico/catalogo
[26] https://github.com/argob
[27] https://capacitacion.inap.gob.ar/academia-de-diseno/
[28] https://www.cultura.gob.ar/institucional/organismos/direccion-de-sistemas/
[29] https://democraciaenred.org/
[30] https://democraciaos.org/es/
[31] https://consulproject.org/en/
[32] https://www.iadb.org/en

repository of open source applications, algorithms, spreadsheets, and other useful digital tools to address specific challenges[33,34].

- GNU Solidario[35] is a non-profit organisation that was established to develop and maintain the open source GNU Health hospital information system[36]. It works globally with a focus on social medicine and health informatics using free and open source software. The origins of the organisation are in Argentina in 2006, with an initial focus on providing free software projects for rural schools using a Linux distribution called Linux Solidario[37]. In 2009, the initiative evolved to focus on helping health professionals and public administrations, and new headquarters were established in Las Palmas de Gran Canaria, Spain[38]. However, the organisation continues to maintain a presence in Argentina and is currently working with San Martín Hospital, the Humberto D'Angelo Health Centre and the Hospital School of Mental Health on eHealth projects using the GNU Health open source system. Generally, the organisation works to promote the status of free and open source software in health institutions.

- GeoLibres[39] is a civil association working to promote the creation and use of geographic data, the adoption of geographic standards and the use of OSS for the development of geospatial information capabilities in public administrations and private companies. They also work to promote the exchange of knowledge and the dissemination of good practices related to free geomatics technologies through community activities.

- CAdESol[40], the Argentine Chamber of Free Software Companies, brings together companies providing solutions based on OSS in Argentina. Established in 2009 and comprising 19 companies, the chamber works to promote business development in OSS through projects, research, promotion, and development. As part of their work, they also support and encourage the development and implementation of OSS in private and public entities.

- GQIS Argentina[41] is a group of users of the open source geographic information system, GQIS[42]. The group shares experiences and ideas regarding the use of the system and provides a forum for professionals, students, and anyone interesting in geomatics to come together and exchange ideas.

[33] https://democraciaenred.org/static/assets/ebooks/DER_Kit_PParticipativo.pdf
[34] https://code.iadb.org/es
[35] https://www.gnusolidario.org/
[36] https://www.gnuhealth.org/
[37] http://blog.gnusolidario.org/2006/10/instalacion-de-debian-gnulinux-en.html
[38] https://www.laprovincia.es/sociedad/2020/09/14/luis-falcon-salud-publica-hay-10429394.html
[39] https://dev.argentina.osgeo.org/about/
[40] https://cadesol.org.ar/about/
[41] http://gqis.ar/
[42] https://qgis.org/en/site/

Policy and legal framework

This section summarises the main open source software related policies and legal acts of the last ten years, including the first known milestone in this domain. The list is presented in a chronological order, starting from the most recent milestone.

- In 2020, the Undersecretariat of Administration Innovation (*Subsecretaria de Innovación Administrativa*) (SSIA) introduced the Federal Digitalisation Plan, which makes free and open source solutions available to help implement the digital transformation of provincial and municipal administrations, decentralised organisations, state companies and universities. Of the 24 provinces and jurisdictions of the country, 8 have already fully implemented the plan and another 7 are in the process of implementation. 38 municipalities have implemented it, with 45 more in the process of implementation. Indeed, the Federal Digitalisation Plan is one of the strategic bases of digital transformation of the Argentine state, guiding the move from paper files to digitally signed documents, and the optimization of other administrative processes.

- In 2018, the ONTI Technological Decalogue[43] was approved by the Argentine government under Provision 2/2018[44]. This was made possible considering Law No. 24,156[45] of October 1992 regarding the financial administration of the national public sector, Decree 434/2016[46] regarding the State Modernisation Plan, and Administrative Decision No. 297/18[47] approving the government's organisation structures and the role of ONTI in intervening in the formulation of policies and implementation of the transformation and modernisation of the state. Published in an updated format in November 2019, the Technological Decalogue (v1.1.0) builds off the Code of Good Practices in the development of public software[48] and mandates that the measures outlined in the Code of Good Practices are applicable to the entire national public sector. With regard to OSS, this means that all national public sector bodies must favour open source technologies and languages over proprietary ones to reduce costs and avoid dependence on suppliers, use open source frameworks[49], use technologies with an active community[50,51] to be supported and receive regular security and functionality updates, and publish new solutions on the Catalogue of Public Software[52]. Beyond the minimum requirements, public sector bodies are encouraged to share their code in the official repository of the Argentine Republic on GitHub[53], use an open and standard licence[54], design applications as a SaaS so that other

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[43] https://www.argentina.gob.ar/sites/default/files/decalogo_tecnologico_onti_version_1_1_0.pdf
[44] http://servicios.infoleg.gob.ar/infolegInternet/anexos/310000-314999/313392/norma.htm
[45] http://servicios.infoleg.gob.ar/infolegInternet/anexos/0-4999/554/texact.htm
[46] http://servicios.infoleg.gob.ar/infolegInternet/anexos/255000-259999/259082/norma.htm
[47] http://servicios.infoleg.gob.ar/infolegInternet/anexos/305000-309999/307689/norma.htm
[48] https://www.argentina.gob.ar/onti/codigo-de-buenas-practicas-para-el-desarrollo-de-software-publico
[49] https://www.argentina.gob.ar/sites/default/files/cbpdsp/como_elegir_un_framework.pdf
[50] https://www.argentina.gob.ar/comunidad-digital-ar
[51] https://comunidad.gde.gob.ar/#
[52] https://www.argentina.gob.ar/onti/software-publico/catalogo
[53] https://github.com/argob
[54] https://www.argentina.gob.ar/sites/default/files/cbpdsp/como_elegir_una_licencia.pdf

agencies can use them easily, and to comply with the government's technical guidelines for interoperability[55].

Open source software initiatives

This section presents an overview of the main open source software related initiatives in Argentina. The list is presented in a chronological order, starting with the most recent initiative.

- FOSS4G, 2021[56]: FOSS4G, Free and Open Source Software for Geospatial, is an annual international conference organised by OSGeo[57] dedicated to geospatial software. The event brings together developers, users, decision-makers, and observers for six days of workshops, presentations, discussions, and cooperation. In 2021, FOSS4G focuses on South America for the first time, and more specifically on Buenos Aires.

- Trámites a Distancia, 2021[58]: Launched in 2018, Trámites a Distancia[59] is a remote platform where any citizen can carry out administrative procedures with public administrations from their home, office or mobile device. The procedures are 100% digital, without the need to go to a public administration in person. So far, 4,000,000 have used the platform, 27% of which were new users who started using it from March 2020 onward on account of the COVID-19 public health crisis.

- GNU Solidario[60] eHealth projects, 2021[61]: GNU Solidario is currently working on a variety of eHealth projects in Argentina using the GNU Health open source system, namely with San Martín Hospital, the Humberto D'Angelo Health Centre and the Hospital School of Mental Health on eHealth projects using the GNU Health open source system.

- Entre todos (Among all), 2020[62]: In 2020, the Secretariat of Public Innovation developed a collaborative portal named Among all (*Entre todos*) to provide recommendations, tools and solutions to help mitigate the impact of COVID-19. Many of the solutions provided on the portal are free and OSS solutions.

- Pure Code Campus, 2019[63]: In 2019, the Secretariat of Education, Culture, Science and Technology of the previous Argentine administration (2015-2019) launched the *Campus Puro Code* initiative. The initiative granted scholarships to students and graduates of technical secondary schools to take virtual courses in open source technologies to acquire official Red Hat certifications. Two courses were offered, the first on the Linux Operating System (72 hours),

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[55] http://servicios.infoleg.gob.ar/infolegInternet/anexos/270000-274999/270664/res6.pdf
[56] https://2021.foss4g.org/
[57] https://www.osgeo.org/
[58] https://www.argentina.gob.ar/jefatura/innovacion-publica/administrativa/tramite
[59] https://tramitesadistancia.gob.ar/tramitesadistancia/tad-publico
[60] https://www.gnusolidario.org/
[61] https://www.gnusolidario.org/
[62] https://www.argentina.gob.ar/jefatura/innovacion-publica/entre-todos
[63] https://www.argentina.gob.ar/noticias/500-estudiantes-y-egresados-de-escuelas-tecnicas-seran-becados-para-estudiar-codigo-abierto

and the second on Middleware - Java and Microservices (40 hours). The scholarship recipients had virtual laboratories to carry out tests, access to study materials, streaming sessions with specialised instructors, and personalised monitoring of their progression.

- Blockchain Federal Argentina, 2018[64]: Launched in 2018, Blockchain Federal Argentina (BFA) is an open source participatory multi-service platform designed to integrate services and applications on blockchain. BFA is based on Ethereum technology, one of the most widespread public blockchains internationally. It is a decentralized platform that works under Proof of Work and allows any developer to create and publish distributed applications to execute smart contracts guaranteed by the blockchain. Individuals, organizations, institutions or companies from any sector interested in deploying applications and services taking advantage of all the characteristics of the platform, or simply contributing to the first development of this nature in the country, can join the initiative and begin to participate.

- Infinity to Discover, 2019[65]: In 2019, children between the age of 12 and 18 were invited to the headquarters of Infinity to Discover (*Infinitos por Descubrir*) in Mendoza, Posadas and Bahía Blanca and the EDUCAR mobile laboratory parked in Berazategui, Buenos Aires by the Secretariat of Education, Culture, Science and Technology of the previous Argentine administration. The children were invited to carry out different activities such as building retro arcade video game machines and installing RetroPie, an open source operating system for Raspberry PI.

- CINE.AR PLAY, 2018[66]: Launched in 2018, CINE.AR PLAY is an on-demand video platform developed by Arset[67] and the National Institute of Cinema and Audiovisual Arts (INCAA)[68] using open source software. Users can watch national movies, documentaries and series online and for free, choosing frm a catalogue that is updated every week. CINE.AR PLAY has 1,800,000 registered users and almost 10,000,000 total views since its creation three years ago.

- Free software as a tool, 2018[69]: The National University of the Litoral[70], together with the Young Cooperatives of San Cayetano and Work for a Better Tomorrow (*Cooperativas Jóvenes de San Cayetano y Trabajo por un mañana mejor*)[71] develop OSS to help strengthen the management processes of collective socio-economic initiatives in the province of Santa Fe. The project seeks to recognise the potential of the use of management software for cooperatives. The process begins with the recognition and systematisation of the cooperatives' business processes. Based on the information gathered, they propose to implement a computerised management system

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[64] https://bfa.ar
[65] https://www.argentina.gob.ar/noticias/cientos-de-estudiantes-argentinos-se-sumaron-la-fiesta-del-software-libre-en-infinito-por
[66] https://play.cine.ar/bienvenida/
[67] https://arsat.com.ar/)
[68] https://www.incaa.gov.ar/)
[69] https://www.argentina.gob.ar/noticias/el-software-libre-como-herramienta
[70] https://www.unl.edu.ar/international/en/
[71] https://www.facebook.com/Cooperativa-J%C3%B3venes-de-San-Cayetano-852247841471602/

based on OSS (Tryton ERP)[72]. Then, meetings are held with the members of the cooperatives and experts, and workshops and training for the use of the system are organised.

- GeoChicas, 2017[73]: GeoChicas is a feminist collective linked to the OpenStreetMap community that works to reduce the gender gap both in the OpenStreetMap community and other communities associated with open data and OSS. Launched at the Latin American OpenStreetMap Conference in 2016[74], the community has successfully completed a range of projects, including the mapping of cancer clinics in Nicaragua[75], mapping of gender-based violence in Oaxaca[76], and training webinars on the topic of technology and data science[77].

- PyAr, 2016[78]: Launched in 2016, PyAr is an organisation working on the promotion, dissemination and development of the Python programming language and related technologies, projects, research, and knowledge. As part of their work, they organise national conferences, local conferences, camps, and meetups throughout Argentina.

- Consul, 2015[79]: Consul is a free and open source citizen participation tool that allows for open, transparent, and democratic governance. Developed in 2015 by the City of Madrid, the software solution is now used in 35 countries and 135 institutions, including the Argentine municipality of Bahía Blanca and Lujan de Cuyo, the cities of Catamarca, Córdoba, Mar Chiquita, San Antonio de Areco and Buenos Aires, and the government of Argentina more broadly.

- DemocraciaOS, 2014[80]: DemocraciaOS is an open source platform developed by Democracia en Red that can be used for participatory budgeting, public consultations, co-creation of laws, and goal tracking. It is currently being used in public administrations in Buenos Aires, San Martin, Sunchales, Vicente Lopez, San Lorenzo, Rosario, the Chamber of Deputies and the Office of the Presidency. All the source code for DemocraciaOS is freely available on GitHub[81].

- OpenStreetMap Argentina, 2013[82]: OpenStreetMap is an open source collaborative project to create editable and free maps. Launched in 2013, the Argentina OpenStreetMap community maintains an active repository on GitHub containing the source code used for the map itself and other resources[83].

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[72] https://www.tryton.org/
[73] https://wiki.openstreetmap.org/wiki/ES:GeoChicas
[74] https://wiki.openstreetmap.org/wiki/State_of_the_Map_Latam_2016
[75] http://umap.openstreetmap.fr/es/map/clinicas-oncologicas-de-nicaragua_169172#9/12.4151/-85.4407
[76] https://www.hotosm.org/updates/2018-04-20_microgrants_2018_hot_supports_eight_osm_communities
[77] https://www.youtube.com/watch?v=olF6h2ytF0E&list=PLEWcsk3vGodo5rUZpermEdQMPBJarT4C-
[78] https://ac.python.org.ar/
[79] https://consulproject.org/en/
[80] https://democraciaos.org/es/
[81] https://github.com/democraciaenred
[82] https://openstreetmap.org.ar/#1.87/-46.62/-24.03
[83] https://github.com/osm-ar

- Catalogue of Public Software, 2010[84]: The Catalogue of Public Software is a collection of links to software, platforms, APIs, and other resources that were developed by the Argentine public administration. Notable OSS solutions include Poncho[85], the library of official styles and components used to design and develop the websites and applications of the Argentine government, Public Consultation (*Consulta pública*)[86], a fork of the DemocracyOS platform with modifications for the government to facilitate debates and participatory voting procedures, and BA Obras[87], an open source project to visualise and analyse information on public works.

- X-Road in Neuquén, 2009[88]: In 2009, the Argentine province of Neuquén developed its own distributed interoperability platform based on X-Road. With Neuquén embarking on an eGovernment journey in 2008, there was sufficient political support to kick-off the development of a new open source interoperability ecosystem named Integrabilidad. In 2017, Neuquén then partly replaced the security layer of the platform, also using X-Road, to facilitate secure data exchange[89]. Following its success, plans are underway to take Integrabilidad to a higher level of governance, with the Commission for Technological Infrastructure and Cybersecurity examining the possibility of using the system at the federal level[90].

- PloneGov in Rosario, 2007[91]: The PloneGov initiative is a collaborative software ecosystem, where public administrations, non-profit organisations and the private sector can work together to share the cost of enhanced capabilities and deliver tools for public administrations and citizens.[92] During the pilot phase of the project, the city of Rosario joined the initiative with 15 other cities globally with the goal of sharing efforts and existing applications among all participants and onboarding more organisations.

- FLISoL, 2005[93]: The Latin American Festival of Free Software Installation (FLISoL) is the largest for the dissemination of free software in Latin America and has been held on an annual basis since 2005. The main objective of the event is to promote the use of open source for all organisations and individuals, by raising awareness of its philosophy, scope, progress, and development.

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[84] https://www.argentina.gob.ar/onti/software-publico/catalogo
[85] https://argob.github.io/poncho/
[86] https://github.com/datosgobar/consulta-publica
[87] https://github.com/datosgcba/obras-abiertas
[88] https://x-road.global/integrity-and-interoperability-the-perfect-match-for-argentinas-public-service
[89] https://x-road.global/xroad-history
[90] https://www.argentina.gob.ar/noticias/comisiones-de-trabajo-del-cofefup-debaten-sobre-la-creacion-de-un-ecosistema-de
[91] http://www.zeapartners.org/articles/rosario008.html
[92] https://joinup.ec.europa.eu/collection/open-source-observatory-osor/document/plonegov-open-source-collaboration-public-sector-plonegov
[93] https://flisol.info/