UNICEF's Open Source Approach to Innovation

*Explore UNICEF's various tools and platforms that operationalise its commitment to open source*

Sanna Bedi, Justin Flory, and Steven Sadi, UNICEF Innovation

#### UNICEF has a 70-year history of innovating for children and believes that new approaches, partnerships and technologies that support the realization of children’s rights are critical to improving their lives.

As recognised in the [UN Secretary-General's Roadmap for Digital Cooperation Report](https://www.un.org/en/content/digital-cooperation-roadmap/) in June 2020,  digital public goods - defined as “open source software, open data, open AI models, open standards and open content” have a critical role in accelerating achievement of the Sustainable Development Goals (SDGs).

UNICEF along with the Governments of Norway and Sierra Leone, and the India-based think tank iSPIRT have jointly established the [Digital Public Goods Alliance](https://digitalpublicgoods.net/who-we-are/), a multi-stakeholder initiative to accelerate the attainment of the sustainable development goals in low- and middle-income countries by facilitating the discovery, development, use of, and investment in digital public goods. The DPGA is an effort to convene a network of partners from different sectors that will contribute to the identification, support, scale-up, and use of software, data, and algorithms that can advance humanity.

As partners explore and scale efforts on digital public goods, UNICEF is sharing its experience in setting up operational processes and tools to support and build open source across all of its work.

*Commitment in Principle*

Early on, UNICEF established the guiding principles for innovation and technology in development, which influenced the [Principles for Digital Development](https://digitalprinciples.org/) in 2014. UNICEF has publicly endorsed the nine Principles (see [long list of endorsers](https://digitalprinciples.org/endorse/endorsers/), including other UN agencies), which represent a concerted effort by donors to capture the most important lessons learned by the development community in the implementation of technology-enabled programmes.

One of the Principles, [Use Open Standards, Open Data, Open Source, and Open Innovation](https://digitalprinciples.org/principle/use-open-standards-open-data-open-source-and-open-innovation/), explicitly advocates for the licensing of open source software to enable greater impact in international development and cooperation. This Principle has guided UNICEF’s approach in creating, investing in and supporting innovations.

Over the past six years, UNICEF has developed various tools and platforms to operationalise its commitment to open source, including tools to foster open source collaboration, agreements to develop new solutions with vendors, and collaborate in the open with UNICEF’s partners.

#### Tools to foster open source collaboration:

UNICEF has worked to progressively operationalize this embracement of open source — an example of which is the [UNICEF GitHub organization](https://github.com/unicef) that currently hosts more than 160 public repositories. Since first launching open source repositories on GitHub in 2007, UNICEF repositories now feature work from 350 contributors . In the last year, UNICEF has accepted code contributions from 83 people, feedback from developers in 37 bug reports, and 46 new formal code change proposals.

An example of an active open source UNICEF project is [projectconnect-app](https://github.com/unicef/projectconnect-app), the repository for the [Project Connect application](https://projectconnect.app/) developed by UNICEF’s Office of Innovation. Project Connect collects crowdsourced contributions to identify schools from satellite imagery from around the world. This accelerates the identification of school locations and subsequently connectivity status. The platform is an important component of [Giga](http://gigaconnect.org/), to assess demand and monitor connectivity in real time.

#### Developing and piloting new open source solutions:

[UNICEF’s Innovation Fund](http://www.unicefinnovationfund.org/)provides funding to start-ups developing new open source solutions leveraging frontier technology solutions for the benefits of children. The Fund is the first financial vehicle of its kind in the UN. To facilitate such investments, in 2015, UNICEF's Office of Innovation, Division of Financial and Administrative Management (DFAM), Supply Division and our legal team developed new clauses that allow for institutional contracts with vendors to keep or place the developed intellectual property (IP) on open source licenses. These vendor contracts (also known as institutional contracts) provide an annex that complements UNICEF’s contracts and general terms and conditions. The IP clauses currently specify the following licenses (or their equivalents):

1. For software: [GNU General Public License](https://www.gnu.org/licenses/gpl-3.0), [MIT License](https://opensource.org/licenses/MIT), or BSD Licenses ([2-Clause](https://opensource.org/licenses/BSD-2-Clause) or [3-Clause](https://opensource.org/licenses/BSD-3-Clause));
2. For hardware: [CERN-OHL](https://ohwr.org/cernohl), [MIT License](https://opensource.org/licenses/MIT), or [TAPR Open Hardware License](https://tapr.org/the-tapr-open-hardware-license/);
3. For design or content: a [Creative Commons](https://creativecommons.org/) Attribution license.

Incorporating open source licenses in vendor contracts is a key step in enabling the adoption of open source software and platforms. Open source licenses, particularly copyleft licenses like the GNU General Public License, provide the legal foundation for other interested parties to collaborate on open source projects while avoiding long procedural processes.

#### Making open source solutions accessible to the UN system through Long-Term Arrangements

To expedite access for UNICEF Country Offices to promising solutions, the Office of Innovation and Supply Division streamlined procurement processes to facilitate and improve the efficiency of collaborations between the Fund’s portfolio startups and UNICEF (through [Long Term Arrangements](https://unicef.sharepoint.com/sites/OOI/SitePages/Long-Term-Arrangements.aspx?CT=1601399028763&OR=OWA-NT&CID=346c3e5a-34da-5843-8c02-9454546350d5)). This will not only have the potential to increase revenue for companies but also result in sustained growth as companies continue to adapt and build their solutions to meet the needs of users across different UNICEF programme countries.

Long Term Arrangement templates have been developed to reflect the aforementioned licenses and allow for any new features and data generated to be placed on open licenses.

#### Shared value partnerships generating open source solutions and insights

UNICEF relies on partnerships with corporate and other open source communities to jointly develop open source platforms.

UNICEF has successfully encouraged partners to support and leverage their funding for open source solutions. By encouraging our partners to also embrace open source and creative commons licenses, we believe we can generate exponential impact from the solutions we deliver.

Our longstanding partner, [Arm](https://www.unicef.org/innovation/reports/arm-unicef-working-together-innovate-impact), the leading semiconductor IP company, provided significant investment in RapidPro, UNICEF’s free and open source framework designed to send and receive data using mobile phones (including basic phones), manage complex workflows, automate analysis and present data in real-time. This investment increased the ability of users to access tools like [U-Report](https://www.unicef.org/innovation/U-Report), the youth messaging service that provides vital information in emergencies, amongst other use cases.

With [ING](https://www.unicef.org/innovation/bouncer/ing-and-unicef-support-5-fintech-startups), the global financing institution, we have invested in a cohort of fintech startups with a specific emphasis on open source. These startups, ranging from agricultural marketplace platforms to specialised education content, will benefit from twelve months of mentorship to allow the successful implementation of open source approaches. Our ambition is to ensure the businesses are successful and the open source solutions are able to reach as many people as possible.

Partners have also joined UNICEF to join technical forces and expertise to generate new open source solutions, data and insights . As a result, UNICEF has structured partnership collaboration agreements - guiding financial and non-financial partnerships with corporate and other partners - to include specific clauses that aim to make intellectual property generated through partnership activities available to the public on appropriate open source or creative commons terms.

With [Nic.br](https://gigaconnect.org/nic-br-and-unicef-to-measure-school-connectivity/), the Brazilian non-profit Network Information Center, we are utilising their data sources to analyse the connectivity status of every public school in Brazil. This will result in open data sets that highlight schools in need of connectivity solutions.

Recently, we also launched a significant new partnership with [Ericsson](https://gigaconnect.org/ericsson-and-unicef-launch-global-partnership-to-map-school-internet-connectivity/) in support of school connectivity mapping on a global scale. In particular, we are collaborating to leverage their data and artificial intelligence (AI) expertise for[Giga](http://gigaconnect.org/)’s [mapping work](http://projectconnect.world/). A critical element of this collaboration will be making the outputs of our work public and available on open source licenses, and encouraging other contributors to embrace open source.

#### Making sense of open source

We have shared all approved institutional tools and frameworks with members of the [UN Innovation Network](https://www.uninnovation.network/) to support easy implementation of these agreements across other UN agencies. UNICEF has also developed knowledge materials and interactive tools to provide an understanding of open source. The [Open Source Guide](https://www.unicef.org/innovation/media/206/file/Open%20Source%20Business%20Model.pdf) published in 2016, documents sustainable business cases for open source technologies. This guide informed UNICEF’s current course on [Open Source Business Models](https://agora.unicef.org/course/info.php?id=18096) and marketing strategies, and is made available to any startups exploring sustainable open source. In addition, you can also browse the [knowledge base of topics](https://jwflory.gitlab.io/heuristics/) about open source community building used in the Innovation Fund Mentorship programme.

联合国儿童基金会的开源创新方法  
探索联合国儿童基金会用于实现其对开源承诺的各种工具和平台  
萨娜·贝迪（Sanna Bedi）、贾斯汀·弗洛里（Justin Flory）和斯蒂文·萨迪（Steven Sadi），联合国儿童基金会创新部

联合国儿童基金会有70年为儿童创新的历史，并认为支持实现儿童权利的新方法、合作伙伴关系和技术对于改善儿童生活至关重要。  
正如2020年6月联合国秘书长数字合作路线图报告所指出的，数字公共产品（定义为“开源软件、开放数据、开放AI模型、开放标准和开放内容”）在加速实现可持续发展目标（SDGs）方面发挥着关键作用。  
联合国儿童基金会与挪威政府、塞拉利昂政府以及印度智库iSPIRT共同建立了数字公共产品联盟（DPGA），这是一个多利益相关方倡议，旨在通过促进数字公共产品的发现、开发、使用和投资，加速低收入和中等收入国家实现可持续发展目标。DPGA是一个努力，旨在召集来自不同行业的合作伙伴网络，为识别、支持、扩大和使用能够推动人类进步的软件、数据和算法做出贡献。随着合作伙伴在数字公共产品领域进行探索和扩大努力，联合国儿童基金会正在分享其在所有工作中建立运营流程和工具的经验，以支持和建立开放源代码。  
  
原则上的承诺  
很早以前，联合国儿童基金会就制定了发展领域的创新和技术指导原则，这影响了2014年发布的《数字发展原则》。联合国儿童基金会公开认可了这九项原则（详见众多支持者名单，包括其他联合国机构），这些原则代表了捐助者共同努力，旨在捕捉发展社区在实施技术驱动项目过程中学到的最重要经验教训。  
其中一项原则是“使用开放标准、开放数据、开放源代码和开放创新”，明确主张对开放源代码软件进行许可，以在国际发展和合作中实现更大的影响。这一原则指导了联合国儿童基金会在创建、投资和支持创新方面的做法。过去六年，联合国儿童基金会开发了各种工具和平台，以落实其对开放源代码的承诺，包括促进开放源代码合作的工具、与供应商共同开发新解决方案的协议，以及与联合国儿童基金会合作伙伴在开放环境中合作。  
促进开放源代码合作的工具：  
联合国儿童基金会致力于逐步将对开放源代码的接纳付诸实践——其中一个例子是联合国儿童基金会的GitHub组织，目前拥有超过160个公开存储库。自2007年首次在GitHub上发布开放源代码存储库以来，联合国儿童基金会的存储库现已包含350多位贡献者的工作。在过去一年中，联合国儿童基金会接受了83人的代码贡献，37位开发者的反馈，以及46份新的正式代码变更提案。  
联合国儿童基金会活跃的开放源代码项目之一是“项目连接”应用程序的存储库，该应用程序由联合国儿童基金会创新办公室开发。“项目连接”收集来自世界各地的众包贡献，从卫星图像中识别学校。这加快了学校位置的识别速度，进而确定了连接状态。该平台是Giga的重要组成部分，用于实时评估需求并监控连接性。  
  
开发和试点新的开源解决方案：  
联合国儿童基金会创新基金为开发利用前沿技术解决方案以造福儿童的初创企业提供资金。该基金是联合国同类基金中的第一个。为了促进此类投资，2015年，联合国儿童基金会创新办公室、财务和行政管理部（DFAM）、供应部和我们的法律团队制定了新的条款，允许与供应商签订机构合同，将开发的知识产权（IP）置于开源许可证下。这些供应商合同（也称为机构合同）为联合国儿童基金会的合同和一般条款及条件提供了补充。目前，知识产权条款规定了以下许可证（或其等效物）：1. 对于软件：GNU通用公共许可证、MIT许可证或BSD许可证（2条款或3条款）；2. 对于硬件：CERN-OHL许可证、MIT许可证或TAPR开放硬件许可证；3. 对于设计或内容：采用创作共用署名许可。  
在供应商合同中纳入开放源代码许可证是促进采用开放源代码软件和平台的关键步骤。开放源代码许可证，特别是GNU通用公共许可证等版权保留许可证，为希望参与开放源代码项目的其他利益相关方提供了法律基础，从而避免了冗长的程序流程。  
通过长期安排使开放源代码解决方案在联合国系统内可访问  
为了加快联合国儿童基金会（UNICEF）驻各国办事处获取有前途的解决方案的速度，创新办公室（Office of Innovation）与联合国系统内的其他部门合作，确保开放源代码解决方案在联合国系统内可访问。