ARTIFICIAL INTELLIGENCE

Dr David Manset– *Senior Project Coordinator OSEE/ITU*

OPEN SOURCE ARTIFICIAL INTELLIGENCE

5-6 Dec 2024
ACSH Training Workshop, Phnom Penh, Cambodia

AI for Good

Session 1: **"Open Source AI for Digital Public Goods: Transforming Public Services in Emerging Economies"**

- AI for Good initiative and community,
- AI basics and use-cases from various countries,
- ITU OSPO’s open source AI reference implementation, example from Kenya,
- Transformative potential of open source AI in addressing challenges and driving innovation in public sector governance.

AI for Good

ITU


AI for Good
Advancing trustworthy AI
for sustainable development
40+ UN PARTNERS
ITU

AI for Good | 47 UN Organisations

CTBTO PREPARATORY COMMISSION
Food and Agriculture Organization of the United Nations
ILO
IMO INTERNATIONAL MARITIME ORGANIZATION
WMO
UNODC United Nations Office on Drugs and Crime
United Nations Office of the Secretary-General's Envoy on Technology
IOM UN MIGRATION
IFAD Investing in rural people
UNCTAD
IAEA
DPPA
UNITED NATIONS Office for Outer Space Affairs
UNRISD
UNITED NATIONS UNIVERSITY
WFP wfp.org
UNECE
unesco
UNFPA
UNAIDS
UN DESA
World Health Organization
WIPO WORLD INTELLECTUAL PROPERTY ORGANIZATION
THE WORLD BANK IBRD • IDA | WORLD BANK GROUP
UNDP
UNIDO
UNITED NATIONS HUMAN RIGHTS OFFICE OF THE HIGH COMMISSIONER
UN environment
UN HABITAT FOR A BETTER URBAN FUTURE
GLOBAL PULSE
UNJSPF United Nations Joint Staff Pension Fund
UNFCCC
OCHA
International Trade Centre
UNODA UNITED NATIONS OFFICE FOR DISARMAMENT AFFAIRS
UN Tourism
UNIDIR
unitar
UNHCR
unicef
ITU
unicri
UN WOMEN
UNICC
UPU UNIVERSAL POSTAL UNION

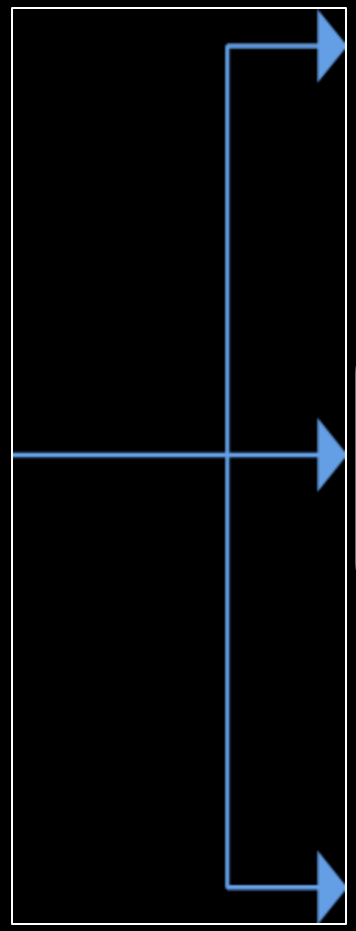
AI for Good | ITU – Committed to connecting the world

193
MEMBER STATES

+900
PRIVATE SECTOR ORGANIZATIONS

+150
ACADEMIA MEMBERS

3
Sectors



ITU Radiocommunication (ITU-R)
Coordinating radio-frequency spectrum and assigning orbital slots for satellites

ITU Standardization (ITU-T)
Establishing global standards

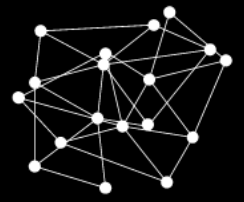
ITU Development (ITU-D)
Bridging the digital divide

AI for Good | ITU – Committed to connecting the world

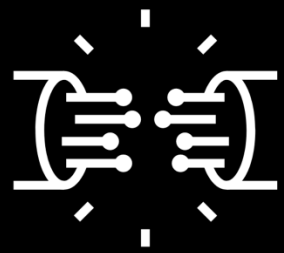
- ✓ **ITU international numbering resources**
  - **Identify 8.9 billion people**
  - **Identify 3.5 billion machines (Internet of Things)**

- ✓ **ITU-standard digital certificates for authentication are a cornerstone of trusted exchanges online**

Video accounts for over 80% of Internet traffic, enabled by Primetime Emmy-winning video-compression algorithms standardized jointly by **ITU, ISO and IEC**.



Optical networks have grown in capacity by an average of **40% a year for the past 40 years.** Such rapid growth, at viable costs, was enabled by ITU standards.



An estimated **95% of international traffic** runs over submarine networks built to ITU standards

AI for Good

THE leading action-oriented, global & inclusive United Nations platform on AI

ALL YEAR, ALWAYS ONLINE + PHYSICAL SUMMIT

Organizer

40+ UN Organizations

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Co-Convener

AI for Good

Identify

practical applications of AI

Scale

solutions for global impact

Accelerate

progress towards the UN Sustainable Development Goals

ITU

Dr David Manset– ***Senior Project Coordinator OSEE/ITU***

ARTIFICIAL INTELLIGENCE

novembre - 2024

What is Artificial Intelligence (AI)?

AI refers to machines performing tasks that typically require human intelligence.

Types of AI:

- Narrow AI: Focused on specific tasks (e.g., language translation, image recognition).
- General AI: A hypothetical AI with human-level intelligence across all domains.
- Generative AI: Produces new content (text, images, music) based on learned patterns.

TYPE	DESCRIPTION	EXAMPLES
Narrow AI	Designed for specific tasks	Siri, Alexa, self-driving cars
General AI	Possesses the ability to understand or learn any intellectual task	Hypothetical AI in development
Superintelligent AI	AI that surpasses human intelligence	Not yet developed
Reactive Machines	Basic AI systems that don't have memory	Chess-playing programs
Limited Memory	AI that can use past experiences to inform future decisions	Self-driving cars

How AI Learns: Neural Networks

Neural networks mimic the human brain, processing data through layers of interconnected nodes.

How it works:
- Input Layer: Data enters (e.g., an image or text).
- Hidden Layers: Process and transform data using weights and biases.
- Output Layer: Produces a prediction or result (e.g., identifying an object in an image).

Analogy: Recognizing a face – different parts of the network analyze eyes, nose, and shape, combining insights for a final output.

The Role of GPUs in AI’s Growth

Challenge: Training neural networks requires immense computational power.
Solution: GPUs (Graphics Processing Units) parallelize computations, making it possible to process vast amounts of data efficiently.
Impact: Reduced time and cost of AI development, enabling breakthroughs like ChatGPT and AI art tools.

Deep Learning Overview

Deep learning mimics the human brain's neural networks to process large data sets. It uses multiple layers of processing for complex tasks like image and speech recognition. Training usually requires vast amounts of labeled data.

What Makes Generative AI Special?

Foundational Models: Large, pre-trained models (e.g., GPT-4, BERT) trained on massive datasets.
Provide a base for tasks like summarization, translation, and content creation.
Generative Process: Creates new outputs by predicting the next word or token based on context.
Examples:
- Text generation (e.g., ChatGPT).
- Image creation (e.g., DALL·E).
- Music and video generation.

The Secret Behind AI Language Models: Tokenization

What is Tokenization? Breaking down text into smaller units (tokens) for the model to process.
Tokens can be words, parts of words, or characters.
Process:
- Input: 'Artificial Intelligence is transformative.'
- Tokens: ['Artificial', 'Intelligence', 'is', 'trans', 'form', 'ative', '.']
Why It’s Important: Enables AI to process any text input efficiently, regardless of language complexity.

Understanding Generative AI

Generative AI creates new original content using existing data. It can generate text, images, audio, and more, making it useful for narratives and creative arts.

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CONCRETE USE-CASES

novembre - 2024

Tina - Argentina

https://www.argentina.gob.ar/tina
https://www.argentina.gob.ar/

AI for Good

AI features in TINA

Source: Mi Salud, Mexico

Supervised learning: The bot is trained with known short inputs to obtain successful outputs.

Migrating towards automated training: training with new massive sources of information such as web pages and previously analyzed documents.

Behavioral sciences: allow you to predict and improve conversation flows.

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Next gen of digital government services in Estonia

AI for Good

Estonia - Burokrat CIO Office

53 Million Euros*

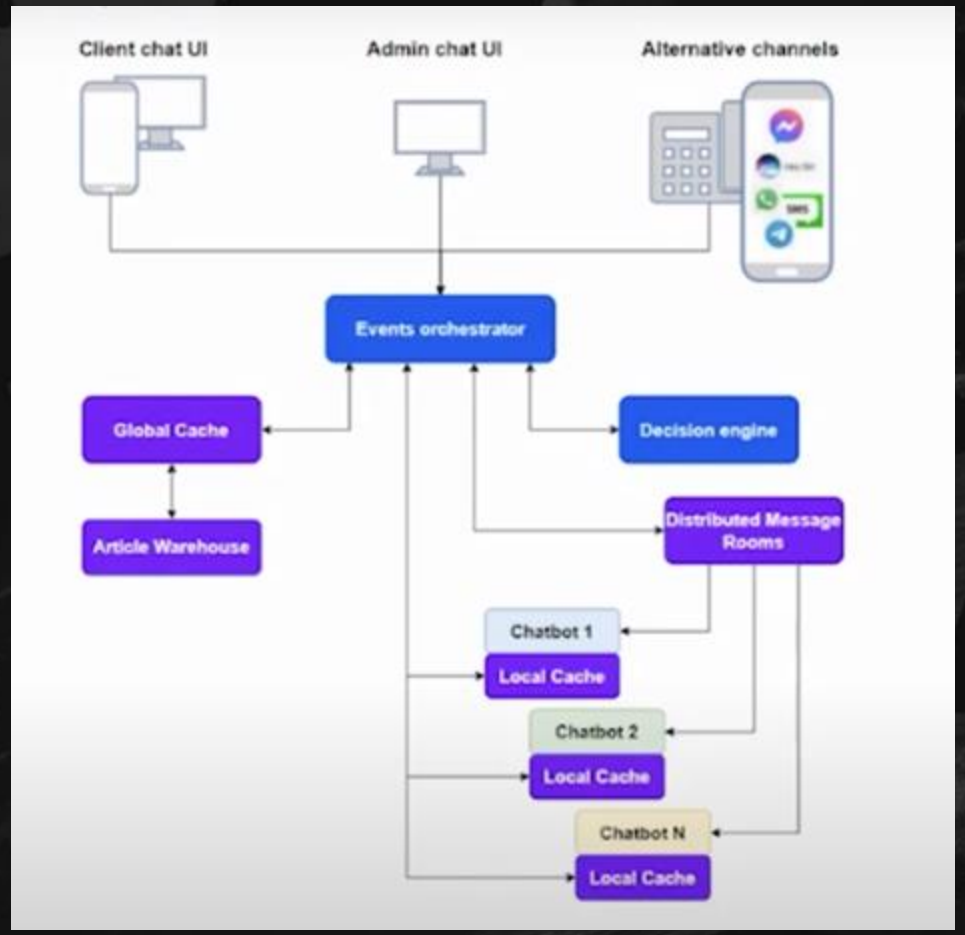
- A speech-based and text-based national unified chatbot solution
- Institutions can join Bürokrat or integrate it into their own infrastructure
- Enables event driven proactive services based on life events
- The elements of the training models are shared
- MVP - Police & Border Control, Consumer protection, National Library

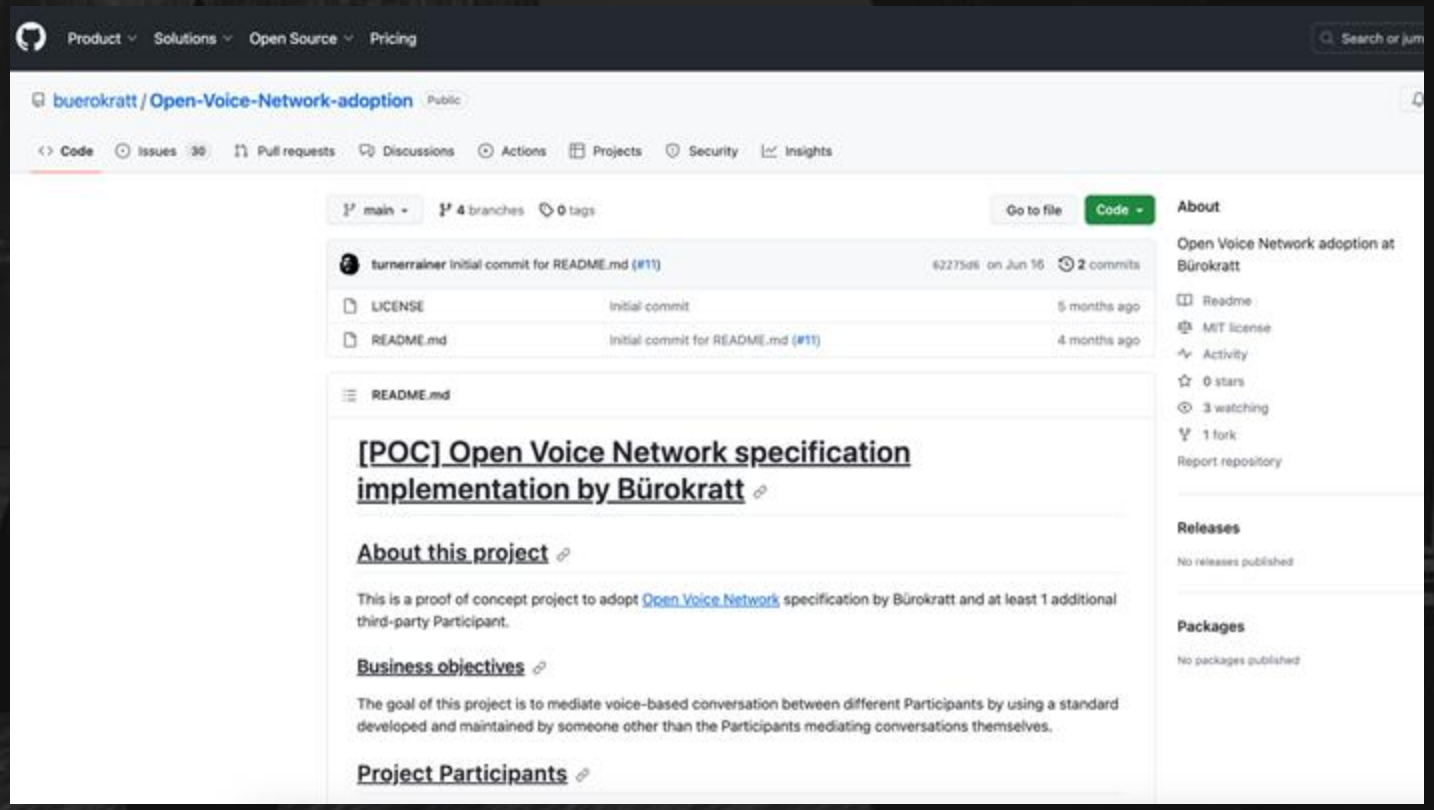
*https://commission.europa.eu/projects/burokratt-programme-and-national-virtual-assistant-platform-and-ecosystem_en
https://www.ria.ee/en/state-information-system/machine-learning-and-language-technology-solutions/burokratt
https://www.kratid.ee/mis-on-kratt
https://www.google.com/search?sca_esv=569891204&rlz=1C5CHFA_enMX961MX962&sxsrf=AM9HkKktj4x6VLwU3eFAb1hrWtB1EAYmUQ:1696193470861&q=burokratt+estonia&tbm=vid&source=lnms&sa=X&ved=2ahUKEwjF5rOK3dWBAxWE3wIHHaDEDSUQ0pQJegQICxAB&biw=1800&bih=831&dpr=1.6#fpstate=ive&vld=cid:cfe857e5,vid:sfh0dQWaUYM,st:0
https://projektid.edu.ee/download/attachments/34120852/Next%20Generation%20Digital%20Government%20Architecture.pdf?version=1&modificationDate=1582268586780&api=v2

Estonia - Burokrat

CIO Office

Is network of Chatbots, open source, enabling the next gen of digital government services





https://github.com/buerokratt

AI for Good

Mexico: AI Governance & Explainability Prototype

Data Protection Institute of Mexico

Réplica de la plataforma de Nowport, la cual incluye su propuesta de solución de transparencia y explicabilidad (replicada por C Minds)

Open Loop

- Evidence based policy making - AI Regulatory SandBox
- Design a governance framework and a practical manual on transparency and explainability
- Prototype it in 10 companies
- Aim to ensure people know when they are interacting with AI/ADM systems.

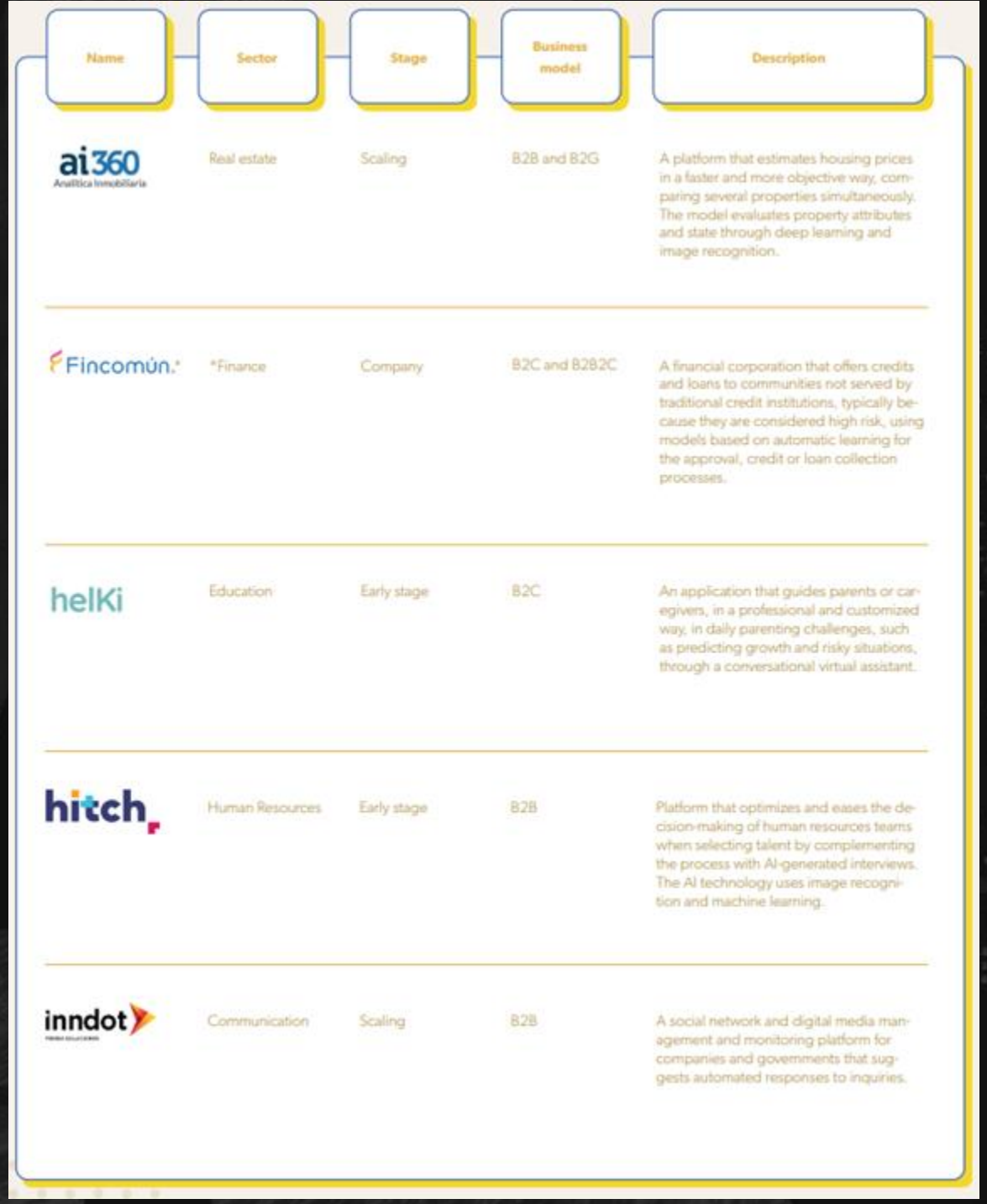
https://openloop.org/programs/ai-transparency-explainability-mexico/

AI for Good

Mexico: AI Governance & Explainability Prototype

Data Protection Institute of Mexico

- Test you approach to policy making with real users/companies in a treatment/control environment
- Gather evidence working with digital ecosystem in the country
- Evidence based policy making



Name	Sector	Stage	Business model	Description
ai360 Analítica Inmobiliaria	Real estate	Scaling	B2B and B2G	A platform that estimates housing prices in a faster and more objective way, comparing several properties simultaneously. The model evaluates property attributes and state through deep learning and image recognition.
Fincomún.	*Finance	Company	B2C and B2B2C	A financial corporation that offers credits and loans to communities not served by traditional credit institutions, typically because they are considered high risk, using models based on automatic learning for the approval, credit or loan collection processes.
helKi	Education	Early stage	B2C	An application that guides parents or caregivers, in a professional and customized way, in daily parenting challenges, such as predicting growth and risky situations, through a conversational virtual assistant.
hitch.	Human Resources	Early stage	B2B	Platform that optimizes and eases the decision-making of human resources teams when selecting talent by complementing the process with AI-generated interviews. The AI technology uses image recognition and machine learning.
inndot	Communication	Scaling	B2B	A social network and digital media management and monitoring platform for companies and governments that suggests automated responses to inquiries.

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AI for Good

Public security and safety

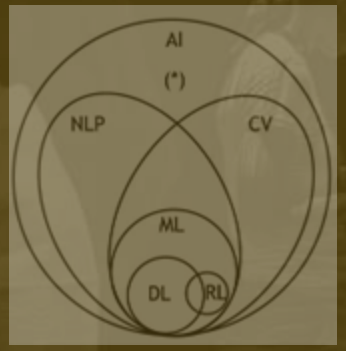
At least **75 out of 176 countries globally are actively using AI technologies to help protect citizens**

AI could help **cities reduce crime by 30% to 40%** and reduce response times for **emergency services by 20% to 35%**

Research indicates that violent crimes and crimes against property concentrate in specific locations and predictable periods. **About 50% of crimes occur in just 5% of locations**

Leverage AI to ensure safety and security for citizens

- Data-driven decisions
- Predictive analyses
- Real time
- Cost-effective
- No black box algorithm
- Digital sovereignty



Some potential use-cases:

(1) To help protect and serve citizens

- Roadway intelligence
- Real time crime mapping
- Crowd management
- Crowdsourcing and crime reporting
- Gunshot and other criminal events detection
- Safeguard privacy and fundamental human rights

(1) To anticipate, prevent and manage events

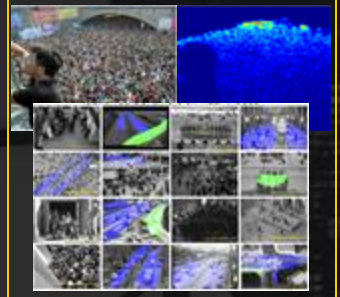
- Social influence network analysis (propaganda, misinformation, fake news etc)
- Laws and Web crawling analysis

Roadway Intelligence

- Driving patterns detection
- Roadway assessment and management
- Traffic control
- Licence Plate Recognition for vehicle tax

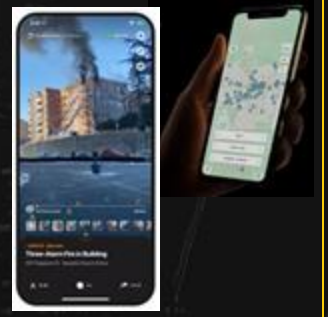
Crime Mapping

- Prevent and/or respond to criminal activities
- Predict future criminal activities
- Estimate safety levels in specific locations
- Crime data more accessible and transparent



Crowd Management

- Monitor community events such as festivals, sports, protests
- Better manage cities facilities
- Crowd count and distribution, density estimation
- Crowd behaviours and management strategies



Emergency Apps

- Connect and live more safely
- Instant help from crisis responders
- Crime reporting
- Personal data protection and control

Trustworthy AI

Bias-free / Responsible / Auditable / Explainable

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AINTUITION

novembre - 2024

ITU OSPO Open-Source AI for Public Services

Use-Cases and Risks

Unacceptable risk | High risk | Limited risk | Minimal risk

Intelligence, law enforcement & defence
- Mass surveillance
- Predictive policing
- Realtime crime mapping
- Crowd management
- Roadway intelligence

Healthcare & humanitarian response
- Child malnutrition detection / **Meron DPG**
- Dengue cases and deaths correlation with real-time climate data / **AEDES DPG**
- Predictive AAC platform for people with speech impairment / **OTTAA DPG**
- Humanitarian aid based on poverty status / **Cider DPG**

Public administration
- Automated back office and RPA

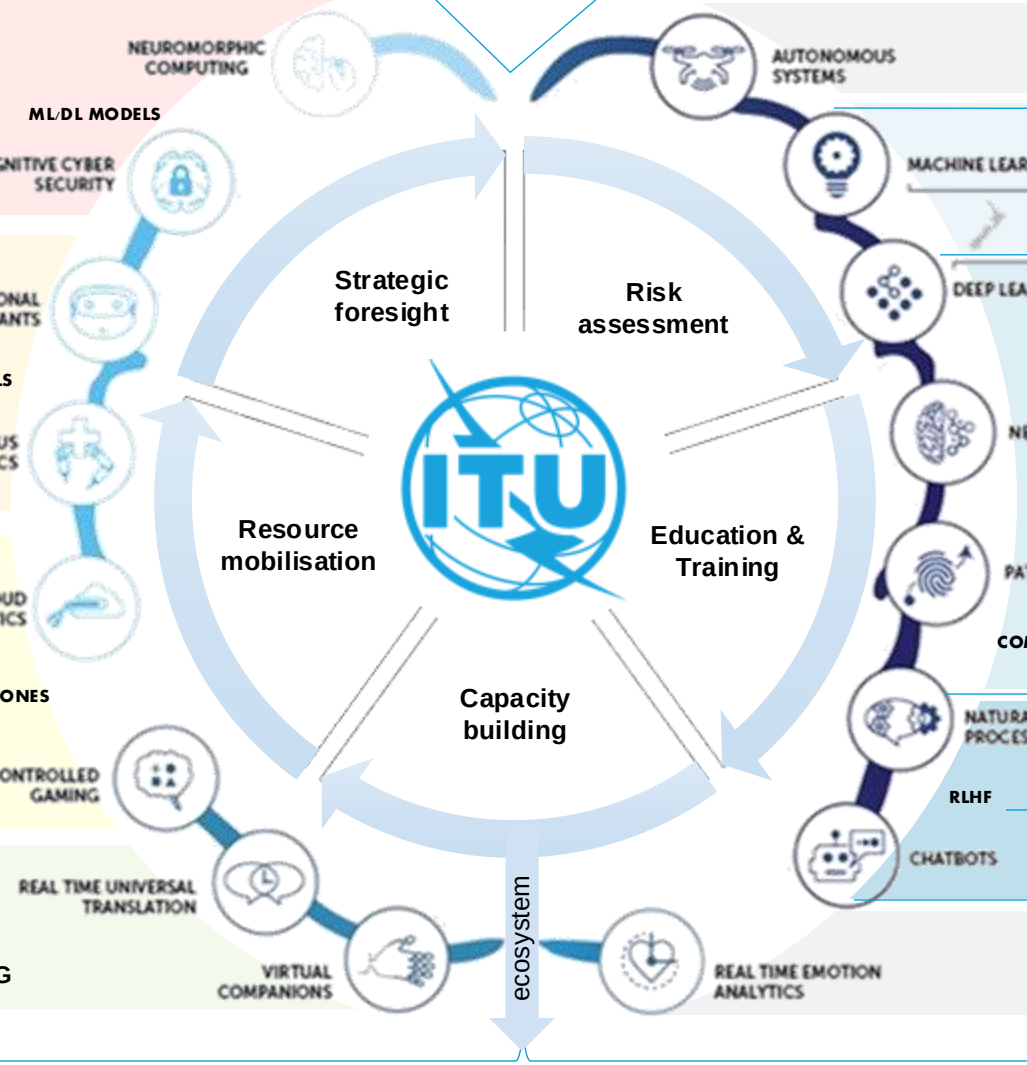
Agriculture
- Precision agriculture / **AI Agro DPG**

Climate & Energy
- Energy demand and response / **CityLearn DPG**

Public administration and education
- Citizen services chatbots / **Burokratt**
- Abusive and cyberbullying behaviours / **Kindly DPG**
- Real-time feedback on pronunciation / **Phoneme Recognizer DPG**

Open Source Technologies

Open data for AI models development | Open-source AI technologies (OST) | Responsible AI | Explainable AI (XAI)

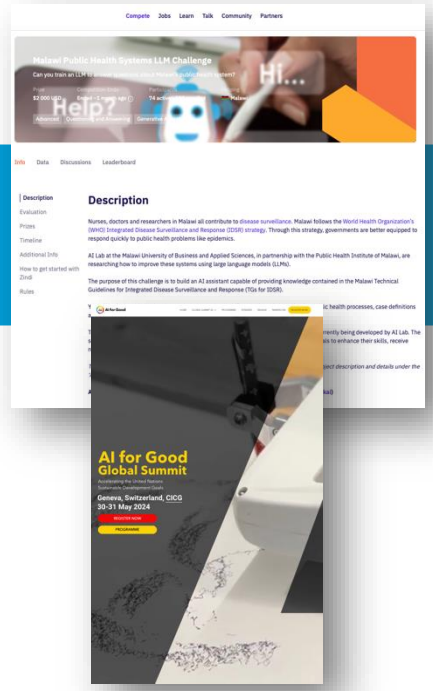


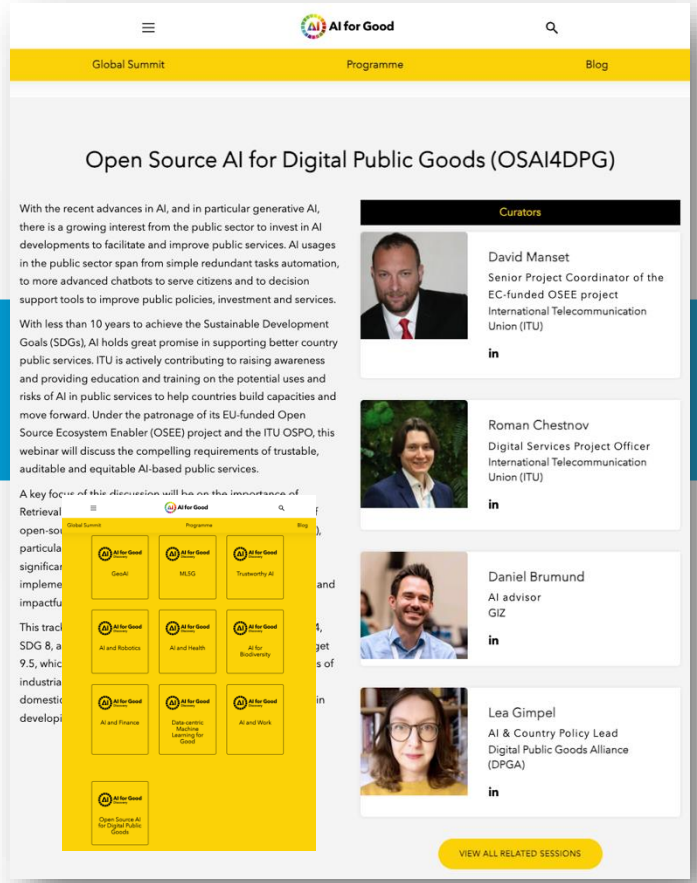
Stable Diffusion
mindsdb
Ivy.ai
tflearn/tflearn
mxnet
theano
fast.ai
TensorFlow
PyTorch
openNN
Keras
Detectron2
Hugging Face
OpenCV
Open Assistant
Meta AI / LLaMa
GPT Engineer
stability.ai
StackLLaMA
opendilab / awesome-RLHF

The hitchhikers guide to the open-source AI galaxy…

ITU OSPO Open-Source AI for Public Services

Create a community





Prototype Implementation for Public Services

7 Webinars in 2024 > 3000 attendees

Open Source (generative) AI for Public Services

OS expected to help **prevent Black box AI problem**

OS AI has the potential **to leverage the knowledge of an entire community**, to balance **out the dominance of big tech players**

Benefits and challenges associated with the use of AI in digital public services
Digital commons, digital public goods

Ongoing global trends in developing Open Source Technologies
Associated issues, approaches, solutions
Open Source Program Offices (OSPOs)

Open data for AI models development

- Bias-free training datasets
- FAIR [4] principles : Findable, Accessible, Interoperable and Reusable

Open-source AI technologies (OST)

- Digital sovereignty
- Build local skills and capacity
- Eliminate discrimination
- Inclusive design
- Increase equitable access
- Reduce duplicative efforts

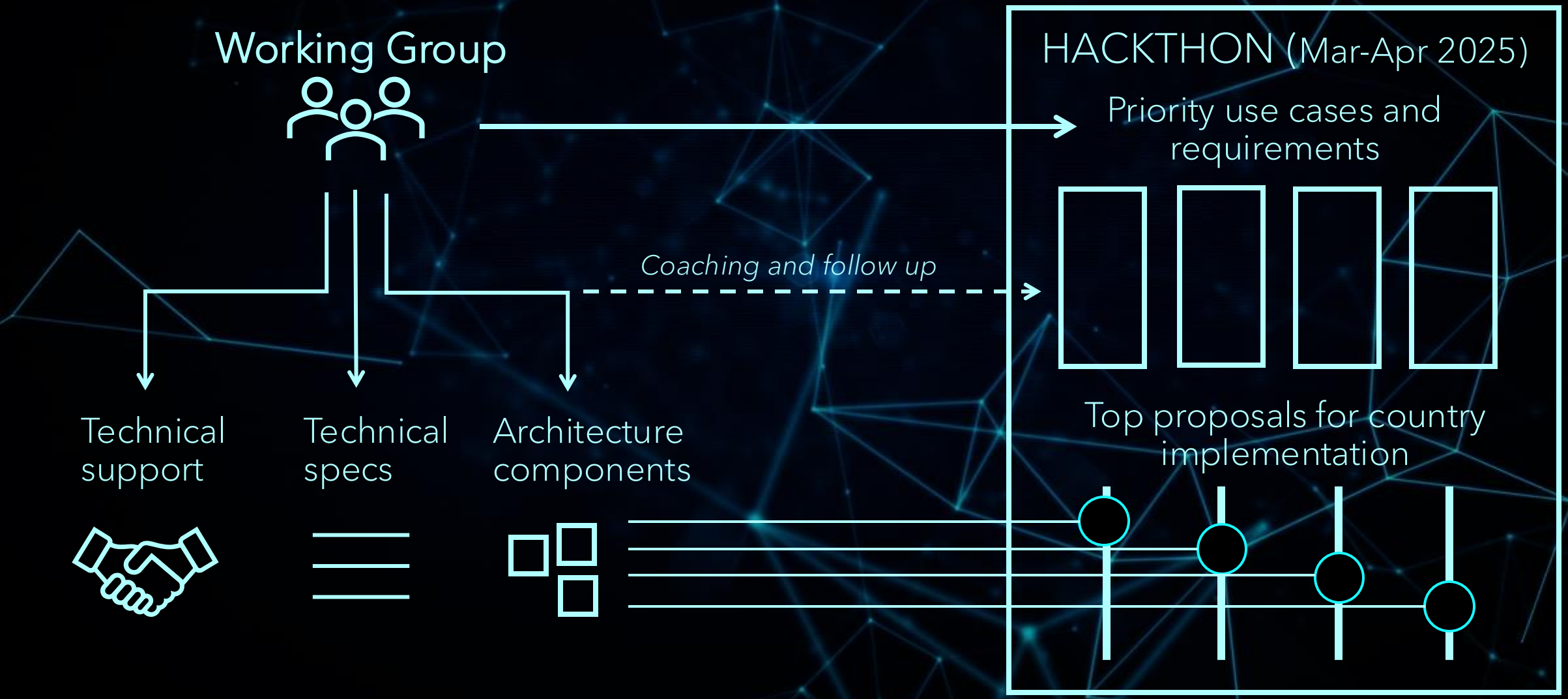
Responsible AI

- Human-centred AI approach
- Ethical AI
- Interpretable and explainable
- Governance framework
- Build trust and confidence

Explainable AI (XAI)

- Models monitoring and accountability : accuracy, fairness, transparency, auditability of outcomes
- Potential biases from training datasets and AI techniques
- Comprehend and retrace how the AI came to a result

DRIVING IMPLEMENTATION THROUGH COMMUNITY ENGAGEMNT



ITU Open Source Programme Office (OSPO)
Open-Source Generative AI for Public Services

An end-to-end open-source implementation framework to build your own GenAI solutions using modular, open-source, standards-based software blueprints

The initiative aims to provide governments and public sector institutions with all the components necessary for assembling custom GenAI applications that are secure, transparent, scalable, interoperable, and cost-efficient

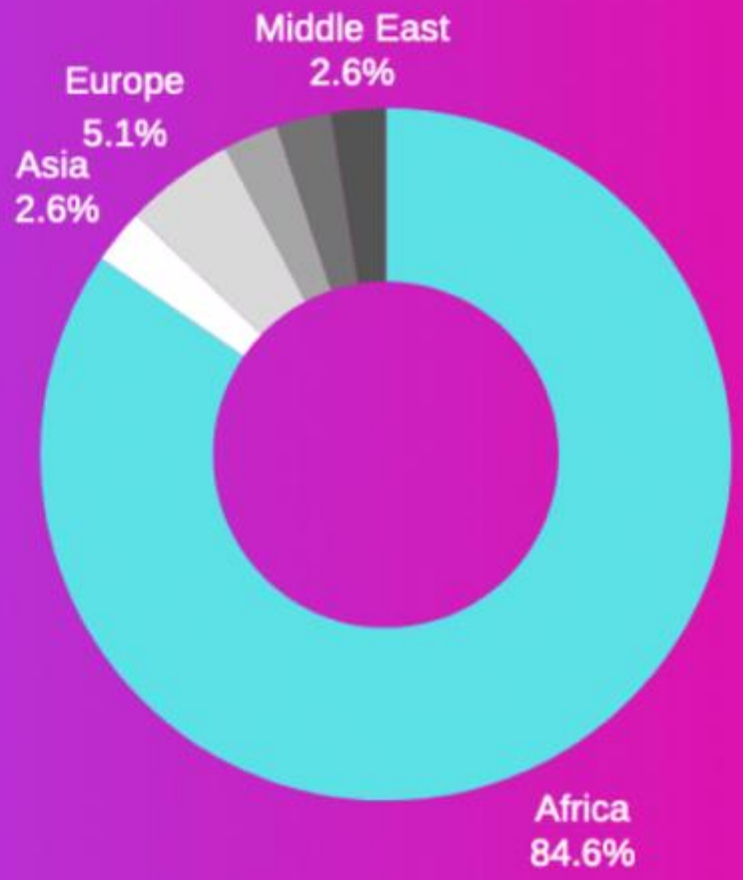
LEARN	Receive **tailored training** on how to tap into the potential of open-source technology to support your digital transformation
DISCOVER	Explore a **library of use cases** to identify opportunities for transformative GenAI applications in your country / institution
DESIGN	Apply **user journey templates** to design better GenAI tools and services and leverage **technical specifications** to define relevant software requirements
BUILD	Assemble prototypes and production-ready solutions using pre-built **software blueprints** and **reference architectures**

Build capacity, receive **tailored technical support**, and benefit from joining a global **community of practice**

Open Source AI Competition Metrics

April-May 2024

180+ participants enrolled, and 19 successful applications, the data shows the following for the regional distribution of the applicants.



A wide distrubution of geographic locations

Open Source AI for Public Services RAG Challenge

#AIntuition

- 180+ Participants
- 19 Submissions
- 36 different countries

Engage community

Promote open-source uptake

Promote public sector use-case

WORKING GROUP ON OPEN-SOURCE AI FOR DIGITAL PUBLIC GOODS

More than 50 members, including experts and specialists from:

- **Public sector**
- **Private sector**
- **Specialized agencies**
- **Development partners**

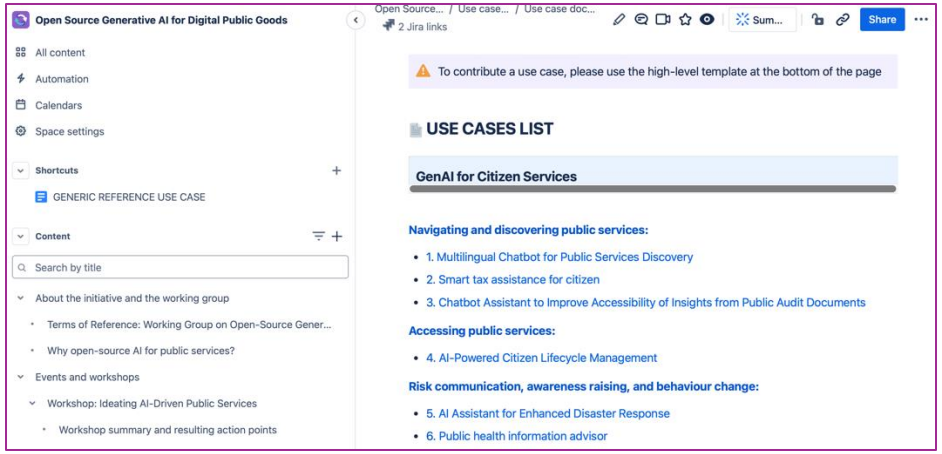
A global community of practice, including:

- **Practitioners**
- **Developers**
- **Policy-makers**

Growing library of datasets curated from public sector documents and data for solution testing and benchmarking

ONBOARD

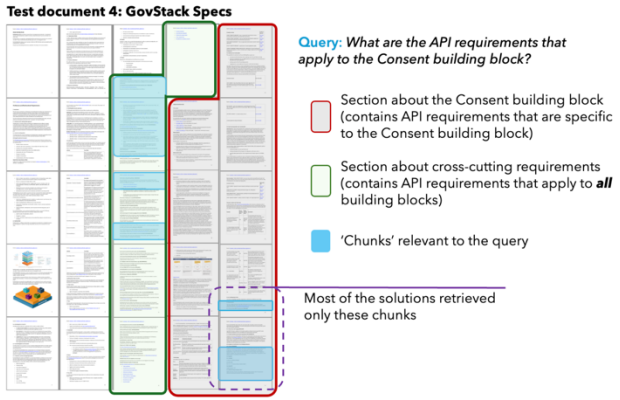
- ITU
- UNDP
- World Bank
- UNICEF
- IAEA
- WIPO
- UNFPA
- UNICC
- UN- Habitat
- UN-OICT
- CTBCO
- FAO



More than 20 public sector use cases documented and analyzed

Core Capability	Importance		
	Low	Medium	High
Conversational AI (Chatbot Integration)	6	5	11
Ingestion of and Retrieval from Unstructured Data	1	3	18
Ingestion of and Retrieval from Structured Data	7	3	11
Integration with Multiple Communication Channels	11	5	6
Multilingual Support	5	7	10
User Interface Customization Capabilities	16	5	1
Data Lakes with Integrations Across Multiple Data Domains	6	7	9
Metrics for Evaluation and Utilization Monitoring	2	9	11
Personalized and Contextualized Assistance	8	3	11
Distributed Edge Computing	20	1	1

Common functional requirements identified and assessed



Common technical needs and issues documented and are being addressed

ITU OSPO Open-Source AI for Public Services

Public sector LLM use-cases

Chatbots for public services

Automated document processing

RPA (procurement, recruitment, ...)

Real time analytics and monitoring

</> </>

Opportunity to improve efficiency and deliver better services using data

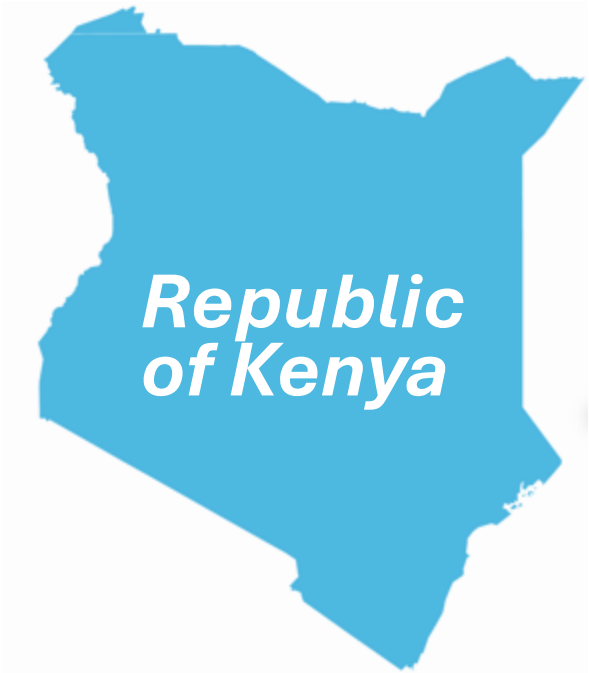
RAG

neo4j NumPy Chroma TensorFlow LangChain Milvus Hugging Face RASA Keras LlamaIndex PyTorch

Public institutions are typically the main owners of data in countries

ITU OSPO Open-Source AI for Public Services

Partnering with a project for the first country use case:



Led by: giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

In collaboration with: GovStack

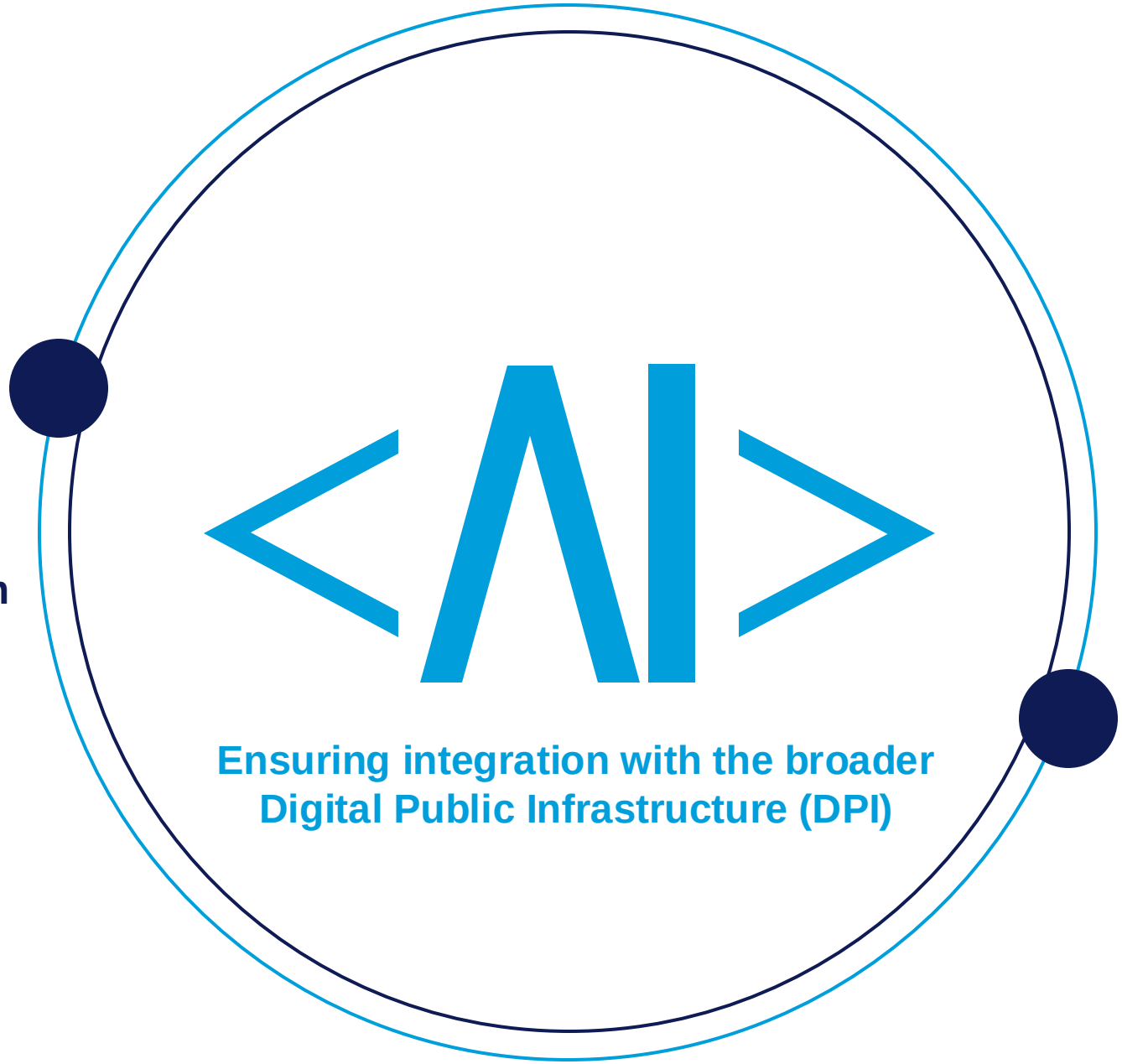
High-level use case:

Multilingual AI chatbot for public service discovery

Working group

- *Help define technical specifications based on functional requirements*
- *Provide input for high-level architecture design, including open-source component*
- *Develop open-source reference implementation that could be support project use case*

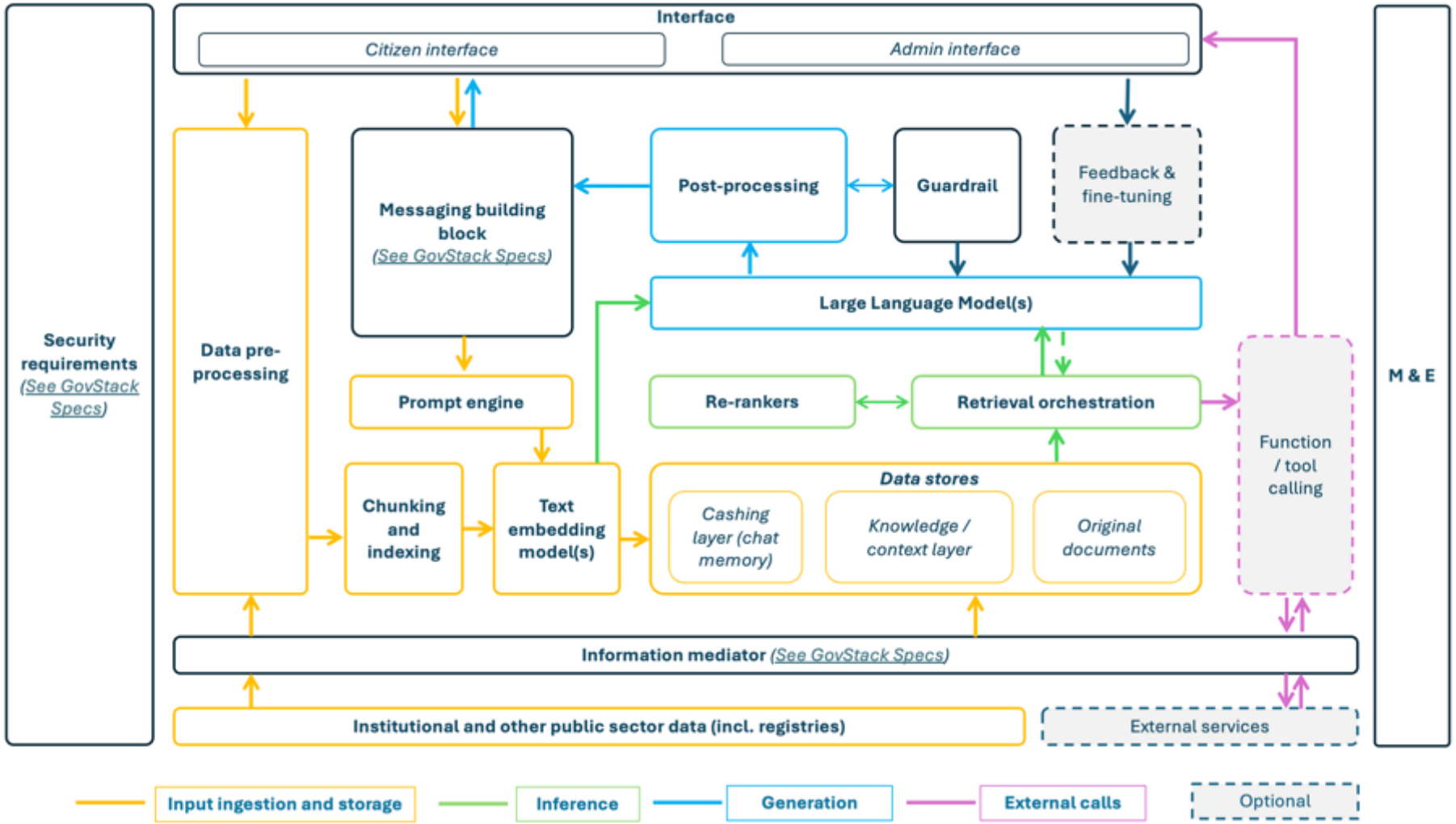
Open
Source
Ecosystem
Enabler



GovStack

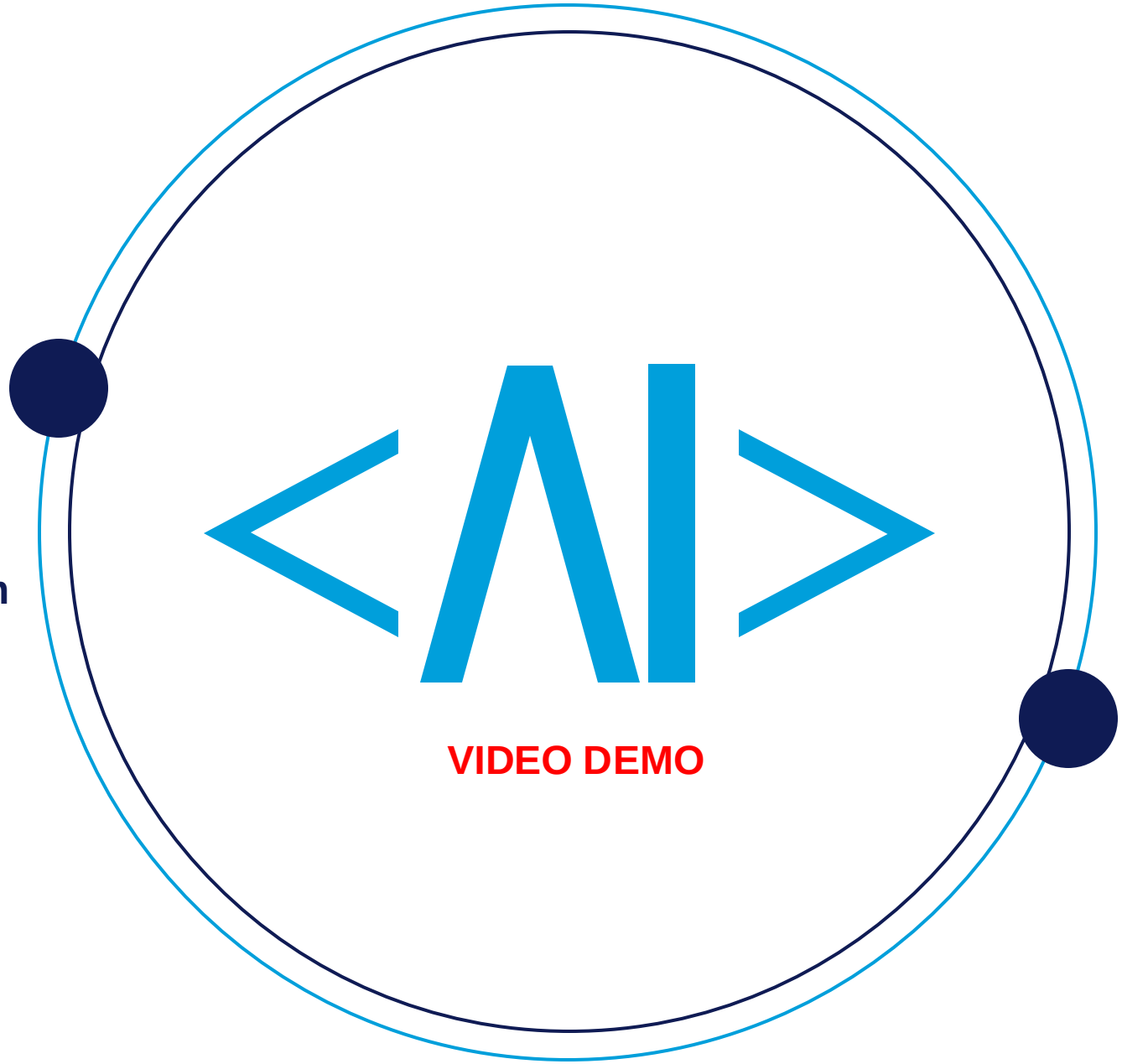
ITU Open Source Programme Office
Open-Source Generative AI for Public Services

Example of a draft **data flow diagram** for an upcoming reference implementation that incorporates GovStack DPI building blocks for interoperability



Bringing together some of the best open-source frameworks and tools at the service of the public sector

Open
Source
Ecosystem
Enabler



VIDEO DEMO

GovStack

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OPEN SOURCE ARTIFICIAL INTELLIGENCE

5-6 Dec 2024
ACSH Training Workshop, Phnom Penh, Cambodia

AI for Good

Session 2: **"Standardizing Open Source AI: Insights from the DPG Standard Update, OSAID, and Capacity Building Initiatives"**

- Accelerating UN SDGs and ensuring alignment,
- Insights from Digital Public Goods Alliance: Integration of open source AI into the Digital Public Goods (DPG) standard,
- Insights from the OSI and Open Source AI Definition (OSAID) initiative,
- OSEE open source training program designed to build capacity in public sector,
- Open Source at the UN: the Open Source United community of practice.

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OSAI / DPG STANDARDS

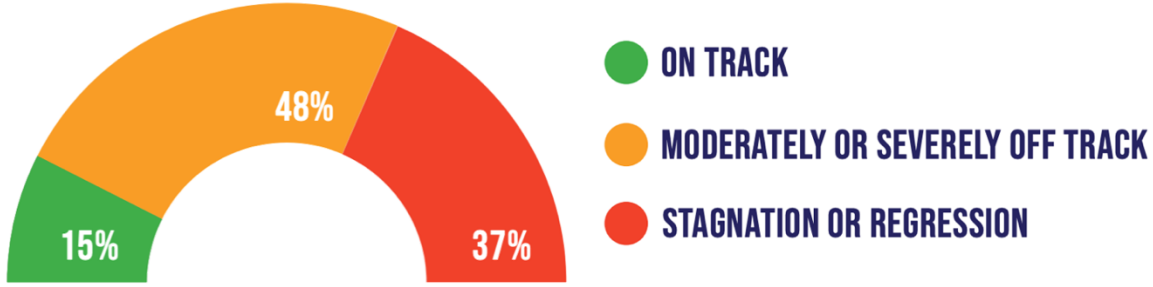
novembre - 2024

In 2015, the United Nations created **17 GOALS** for **2030** to move toward peace and prosperity for people and the planet

*Today, only **15%** of the*

SUSTAINABLE DEVELOPMENT GOALS

for 2030 are on track



Digital Public Goods (DPGs)

Defined in the **UN Secretary General's roadmap on digital cooperation**

DPGs are **open-source software, open data, open AI models, open standards, and open content**

that adhere to privacy and other applicable laws and best practices, do no harm by design, and help attain the SDGs

Need to **understand**, **develop and scale DPGs and DPIs ecosystems**

- Thought leadership
- Capacity building
- Sustainable support

AI for Good

Accelerating UN SDGS

Less than 10 years to achieve the United Nations Sustainable Development Goals.

AI holds great promise.

ITU

AI for Good

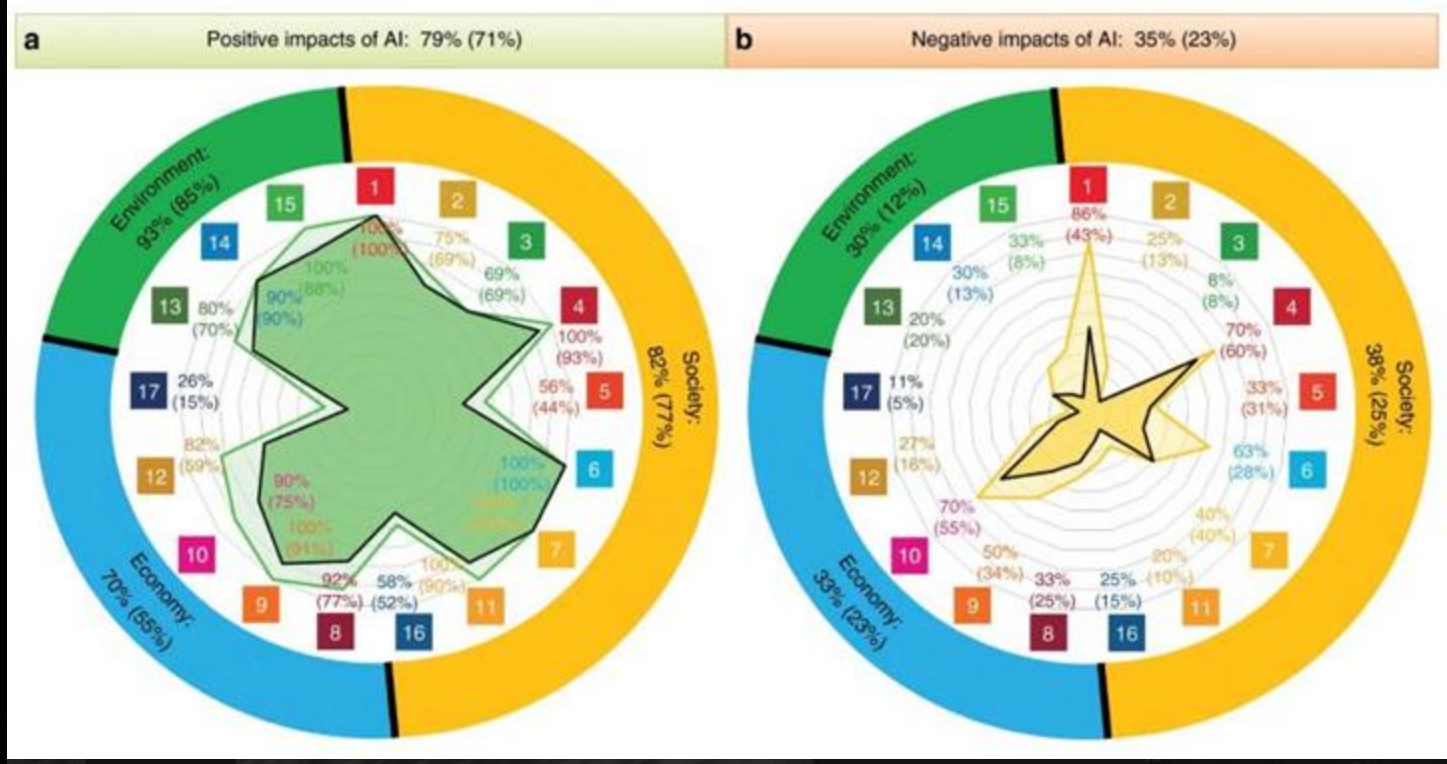
Mapping AI to SDGs

AI can help to **positively impact 134 targets** across all the goals.

AI can also **inhibit 59 targets**.

Fig. 1: Summary of positive and negative impact of AI on the various SDGs.

From: The role of artificial intelligence in achieving the Sustainable Development Goals



38 UN PARTNERS

ITU

Digital Public Goods

- ✓ Advance the SDGs
- ✓ Open Source
- ✓ Do No Harm

AI Democratization and the SDGs

70 % of the Sustainable Development Goals rely on digital solutions, according to a UN estimation

AI systems can play a key role - if they are available, can be developed locally, benefit communities, and are governed inclusively

to **democratize AI** in all its facets, **digital public goods** are essential

OS is essential for democratizing AI

- **Use**
- **Development**
- Benefits
- Governance

Accessible development resources are not enough but an essential part to ensuring that everyone can benefit from AI technology

To tackle other aspects, we need to embrace coalition building and community-based approaches

DPGA AI Community of Practice and Standard Updates

- AI COP co-hosted by DPGA and UNICEF

- Primary Tasks:
  - Align on key definitions and concepts related to AI and DPGs.
  - Identify and propose solutions that can be adopted as AI DPGs.
  - Contribute to evolving recommendations for the DPG Standards Council to amend the DPG Standard to better accommodate AI technologies.
  - Review and endorse reports and recommendations from the group's work.

- Recommendations currently under review in DPG Standard Council that is releasing a series of change proposals to the Standard, published and opened on github for community input.

Fundamental change proposal to the DPG Standard

We propose that to qualify as a Digital Public Good, open source AI systems must provide the following components:

- Data
  - Datasets - the dataset(s) used to train the system should be open under conformant licenses to the Open Definition.
- Code
  - Data pre-processing - available under OSI-approved license.
  - Training, validation, and testing - available under OSI-approved license.
  - Inference - available under OSI-approved license.
  - Supporting libraries and tools - available under OSI-approved license.
- Model
  - Model architecture - the type of model, layers, and structure should be available under an OSI-approved license.
  - Model parameters - weights, optimizers, coefficients, and other applicable hyperparameters should be available under OSD-conformant terms (this could include OSI-approved licenses or terms and conditions).

- These components are based on the Model Openness Framework (MOF) and Open Source AI Definition Checklist to evaluate machine learning systems.
- Other components listed in these frameworks, such as research papers, evaluation results, sample model outputs, among others are optional unless specified in other indicators of the DPG Standard.
- Community Feedback:
  - Open for public comment from Nov 4–Dec 4, 2024, on GitHub.
  - Insights will shape final refinements to the Standard.

Open Source Initiative

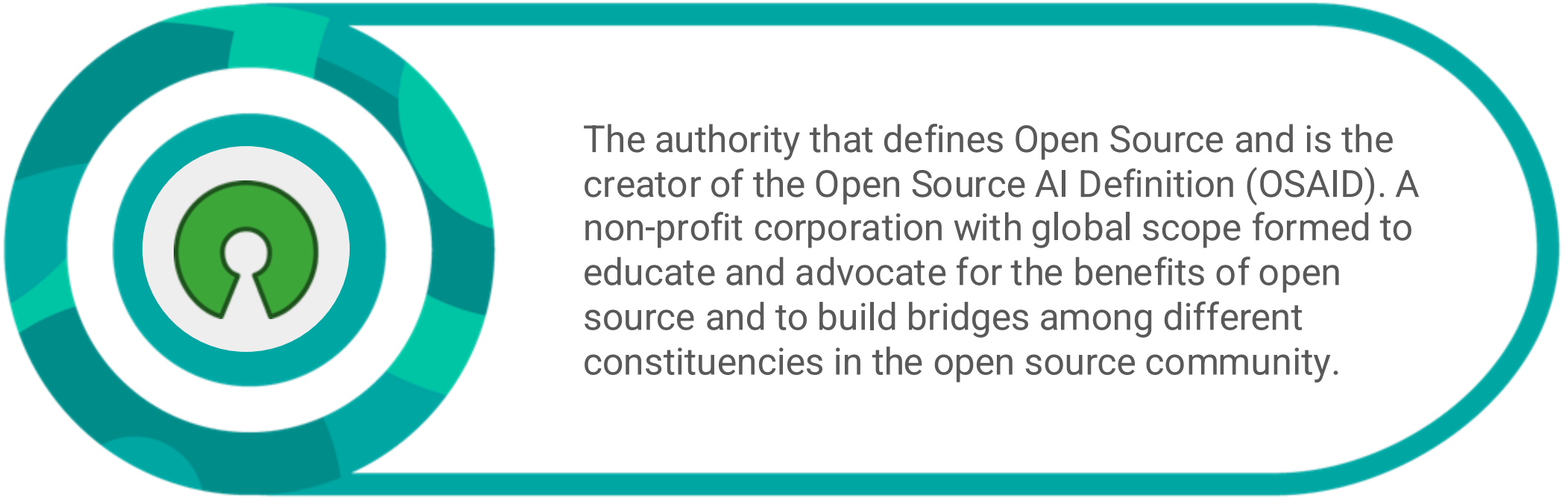
The Open Source AI Definition

Nick Vidal + Mer Joyce

Supported by:

ALFRED P. SLOAN FOUNDATION

Open Source Initiative (OSI)



The authority that defines Open Source and is the creator of the Open Source AI Definition (OSAID). A non-profit corporation with global scope formed to educate and advocate for the benefits of open source and to build bridges among different constituencies in the open source community.

Benefits of Open Source AI

Digital Public Goods Alliance

by Lea Gimpel

Transparency + Safety

OSAI provides information essential for auditing systems and to mitigate bias, ensures accountability and transparency of data sources, and accelerates AI safety research

Market Deconcentration + AI Polyculture

OSAI makes more models available, spurs innovation and quality due to increased competition and tackles AI monoculture by providing more stakeholders access to foundational technology.

Diverse Applications

OSAI gives developers access to resources crucial for developing context-specific, localized applications that are representative of cultural and linguistic diversity and allow for model aligned with different value systems.

M or N

Why Define Open Source AI Now?

Frontier of OS

Defining Open Source AI is the most significant challenge facing the open source movement.

Shaping Regulation

Government regulations have begun in the EU, US, and elsewhere. We have the opportunity to share these new policies and laws by defining OSAI.

Combat Open-Washing

Companies are calling AI systems “open source” even though their licenses contain restrictions that go against the accepted principles and freedoms of open source.

What is Co-Design?

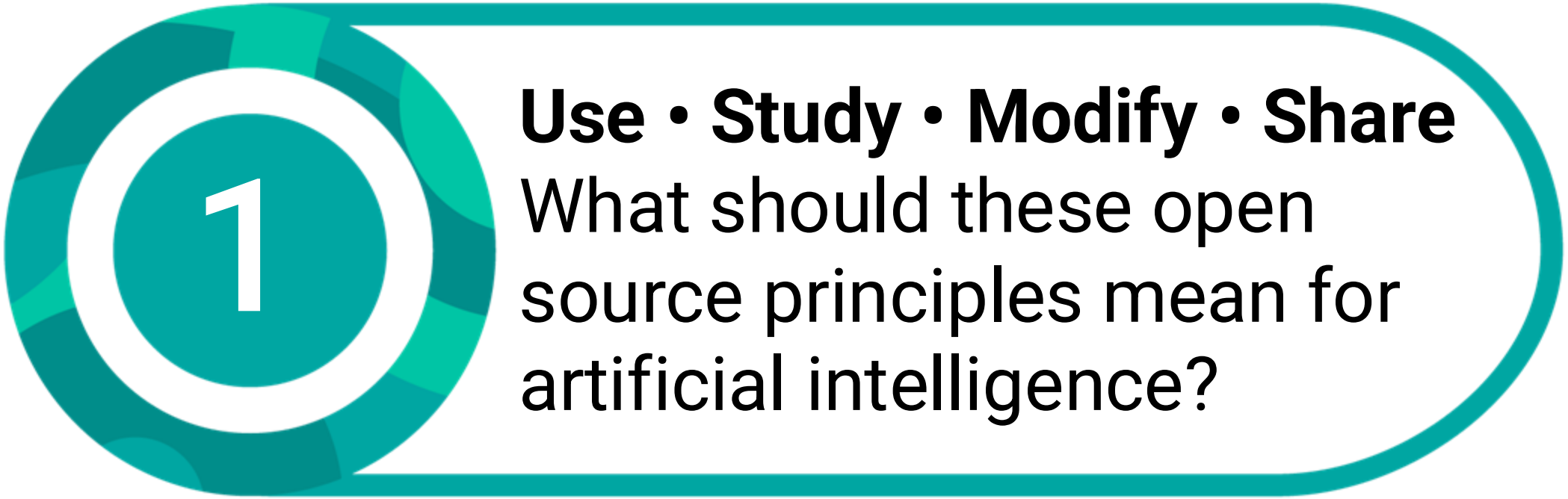
A set of creative methods for making collective decisions by sharing knowledge and power.


NERDEARLA
Co-Designing the OSAID
A Global Snapshot
Our co-design process included in-person workshops on five continents – South America, North America, Africa, Europe, and Asia – and virtual participants from more than 35 countries.
Study
Study how the AI system works, and inspect its components. Access to the AI system components in the preferred form to make modifications is a precondition of
Share
Share the system, with or without modification, for any purpose, [without limitations].
USE
Use the system for any purpose without any limitations and without having to ask for permissions.
Become a member of OSI
TOWARDS A DEFINITION OF OPEN SOURCE AI
Considerations towards Alternate Data Licensing
INDIA FOSS
DEEP LEARN IND

Who Are OSAI's Stakeholders?

Developers	Deployers	End User	Subject
• Create OSAI systems and/or component • Ex: ML researcher in academia or industry	• Seek to study, use, modify, or share an OSAI system or component • Ex: An AI engineer, a health researcher	• Consumes an OSAI output, but doesn't seek to study, use, modify, or share the system. • Ex: casual chatbot user	• Unintentionally affected upstream or downstream by an OSAI. • Ex: photographer finds her image in an OSAI dataset, person whose job or loan application is reviewed by an OSAI
31%	**46%**	**≈ 90%**	

OSAID Co-Design Question

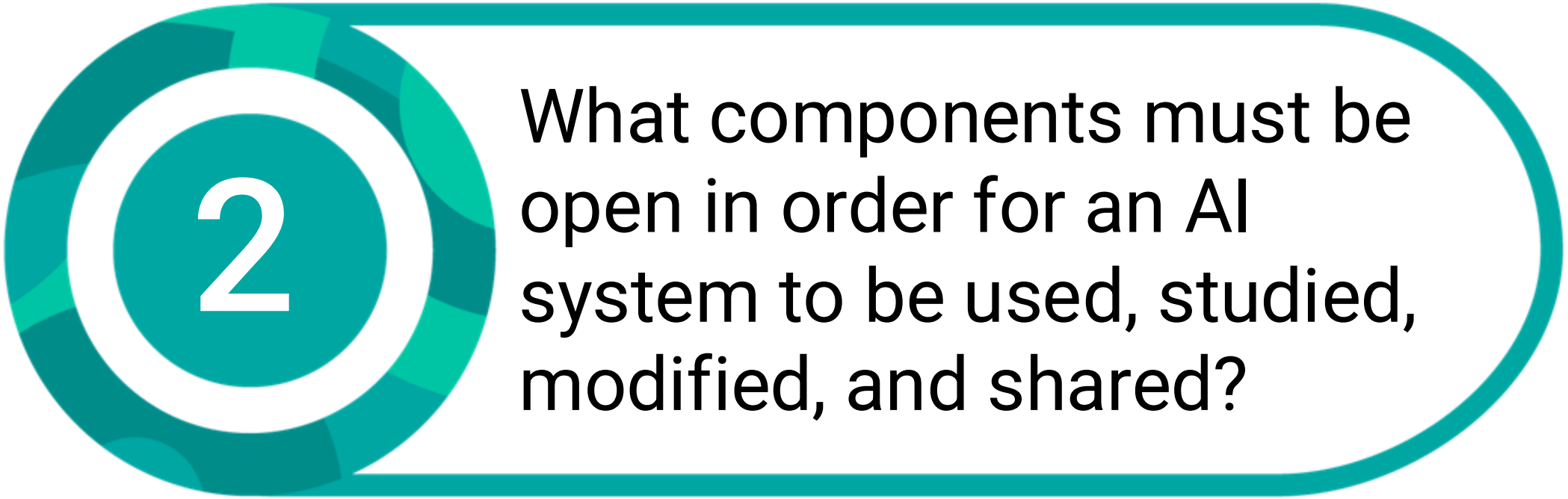


Open Source AI Definition Four Freedoms

Free Software Foundation

1. **Use** the system for any purpose and without having to ask for permission.
2. **Study** how the system works and inspect its components.
3. **Modify** the system for any purpose, including to change its output.
4. **Share** the system for others to use with or without modifications, for any purpose.

OSAID Co-Design Question



Requirements and Version 1.0

Requirements of the OSI Board and where the definition has landed for v1.0

Current Version: 1.0

Open Source AI Definition

4 Freedoms	Open Weights	Open Code	Data Info
• Use • Study • Modify • Share	• Model weights and parameters	• Source code used to train and run the system	• Dataset or detailed information about the data used to train the system

We’ve known that the availability of training data was THE ISSUE

Data Information

Data Information: Sufficiently detailed information about the data used to train the system so that a skilled person can build a substantially equivalent system, together with the code requirements listed below. Data Information shall be made available under terms that allow the copying, modification, and redistribution of the information.

In particular, if used, this must include:

1. a listing of all publicly available training data;
2. a listing of all training data obtainable from third parties and where to obtain it, including for a fee; and
3. a detailed description of all data, including unshareable data, that provides information about the provenance of the data, its scope and characteristics, how the data was obtained and selected, the labeling procedures and data cleaning methodologies.

Data Classes

- **Open training data**: data that can be copied, preserved and reshared. It provides the best way to enable users to study the system.
- **Public training data**: data that others can inspect as long as it remains available. This also enables users to study the work. However, this data can degrade as links or references are lost or removed from network availability. To obviate this, different communities will have to work together to define standards, procedures, tools and governance models to overcome this risk, and Data Information is required in case the data becomes later unavailable..
- **Obtainable training data**: data that can be obtained, including for a fee. This information provides transparency and is similar to a purchasable component in an open hardware system. The Data Information provides a means of understanding this data other than obtaining or purchasing it. This is an area that is likely to change rapidly and will need careful monitoring to protect Open Source AI developers.
- **Unshareable non-public training data**: data that cannot be shared for explainable reasons, like Personally Identifiable Information (PII). For this class of data, the ability to study some of the system's biases demands a detailed description of the data – what it is, how it was collected, its characteristics, and so on – so that users can understand the biases and categorization underlying the system.

ARTIFICIAL INTELLIGENCE

Dr David Manset– ***Senior Project Coordinator OSEE/ITU***

OPEN SOURCE

novembre - 2024

AI for Good | Multi-stakeholder
Interdisciplinary
Inter-generational

OPEN SOURCE

Global Digital Transformation

- **Digital Divide in the Global South**: Many countries face challenges in leveraging digital tools due to limited technical capacity, infrastructure, and resources.
- **Fragmented Ecosystem**: Lack of coordination and harmonized efforts among stakeholders hampers sustainable digital transformation.
- **Barriers to Open Source Adoption**: Limited awareness, expertise, and support systems restrict the effective use of open source technologies for development.
- **Underutilization of Digital Public Goods (DPGs)**: Despite their potential, DPGs are underused due to gaps in accessibility, localization, and capacity-building initiatives.
- **Inadequate Policy Frameworks**: Absence of standardized policies and guidelines to promote open source and digital public goods integration in national development strategies.
- **Dependency on Proprietary Solutions**: High reliance on costly, closed-source technologies limits innovation and inclusivity.
- **Missed SDG Opportunities**: Inadequate digital capacity in global south countries hinders their ability to achieve Sustainable Development Goals (SDGs).

Open Source Ecosystem Enabler

Transforming the Future: Open Source Innovations for Digital Public Goods and Infrastructures

David Manset
International Telecommunication Union (ITU)

#OSEE

Funded by the European Union

Digital Public Goods (DPGs)

Defined in the **UN Secretary General's roadmap on digital cooperation**

DPGs are **open-source software, open data, open AI models, open standards, and open content**

that adhere to privacy and other applicable laws and best practices, do no harm by design, and help attain the SDGs

Need to **understand**, **develop and scale DPGs and DPIs ecosystems**

- Thought leadership
- Capacity building
- Sustainable support

Open Source Ecosystem Enabler (#OSEE)

- **European Commission** funding
- Implemented by **ITU & UNDP**
- NDICI Global Gateway Programme
- **3.5 year** plan, started **2023-09-01**
- **Global coordination**
- **2 pilot countries**

Funded by the European Union

Building digital public services for impact

OBJECTIVE

To enhance the **capacity** of local, regional public and private actors to **adopt open-source** for **digital government services**

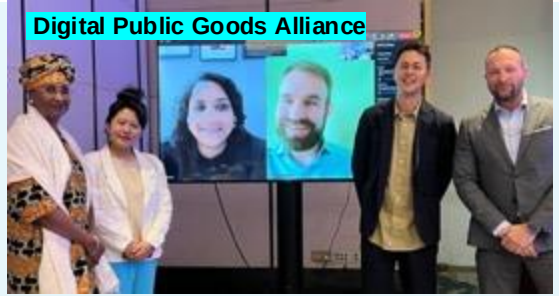
OUTCOMES

Improved **knowledge**, coordinated **actions**, and strengthened local public and private actors' **capacities** to support the adoption and creation of open-source for digital public services

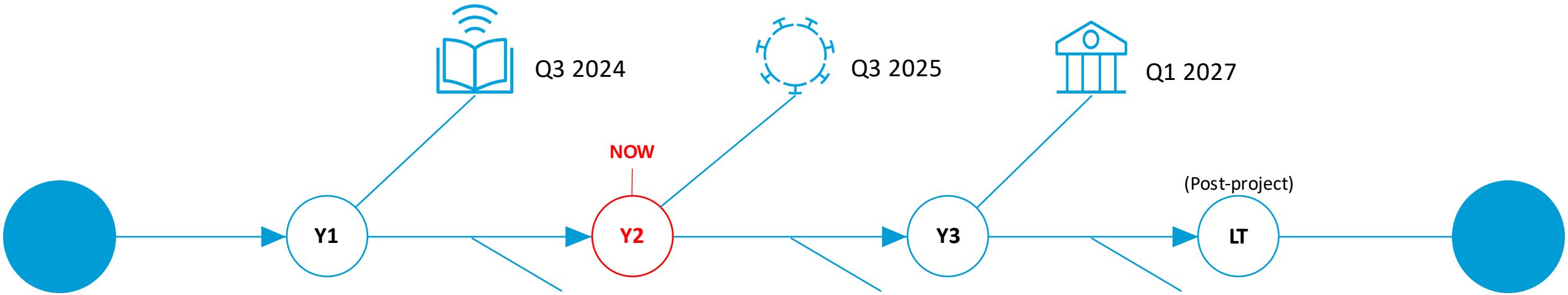
OSEE Framework

2 National OSPOs

Knowledge Base



OSEE Initiative
Phases and Milestones



Foundations and framework

Develop and disseminate the OSEE Framework

Pilot activities in selected countries

Pilot activities in 2 target countries and established OSTFs

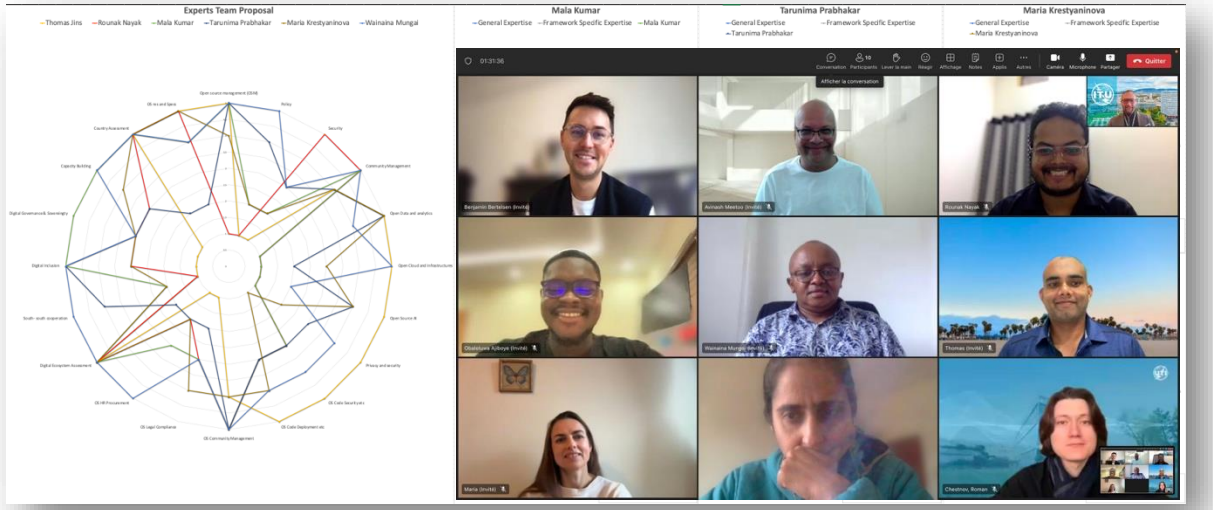
Expand and disseminate

Establish a global Knowledge Hub and disseminate

Sustainability and resilience

Develop and disseminate OSEE Framework and lessons learned

The OSEE Framework



International team of OSS experts

- Experts from 8 different countries
- Experienced in DPGs in various sectors
- In collaboration with ITU Academy

204 applicants

28 shortlisted

Work Completed: 30th June 2024

Miro Board and MoScoW Analysis – collects framework concepts and groups them by priority

Encryption																									
66	Data quality																								
33	50	Data lifecycle																							
16	16	50	Data hosting																						
16	16	33	66	Code hosting																					
50	50	33	16	33	OS code security																				
33	50	50	33	16	50	Risk assessments																			
0	0	0	16	0	0	33	Change management																		
33	16	16	33	0	16	16	33	Standard operating procedures																	
50	16	16	16	0	16	0	0	50	Interoperable solutions																
50	16	33	33	33	33	16	16	16	33	Anonymization															
33	16	16	33	33	33	16	0	33	16	33	Sandbox environments														
0	16	16	16	16	0	0	0	0	16	16	33	DevOps													
0	16	16	16	33	0	0	0	0	16	16	16	50	Technical documentation												
0	0	16	16	16	0	0	16	33	0	16	33	16	33	Technical support and maintenance											
0	0	0	0	0	0	0	0	0	0	0	0	33	33	User manuals											
0	0	0	0	0	0	16	16	0	16	0	16	50	16	0	16	Scalability									
0	0	0	33	16	0	16	33	33	0	0	33	0	0	16	16	16	Staff upskilling								
16	16	33	16	0	0	0	16	16	16	0	0	16	0	16	0	16	0	Open cloud infrastructure							
0	0	0	0	0	0	0	0	0	16	0	0	16	0	16	0	0	0	33	(Common) tech stacks						

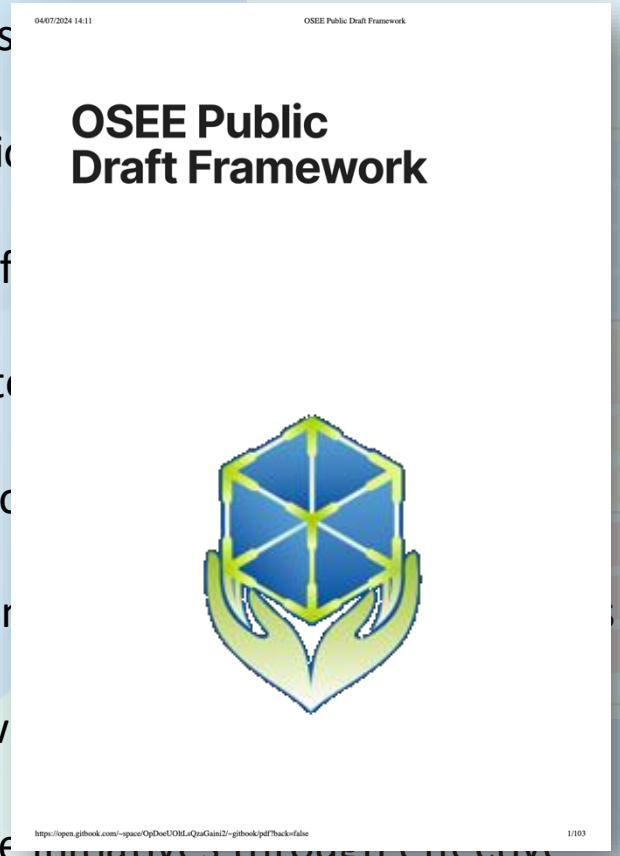
Similarity Matrix – shows how often two cards are group together (in percentages)

Name	OS Adoption and Development	OS Best Practices	OS Code Quality	OS Code Reuse	OS Community Management	OS Requirements and Specifications	OS Technology Basics
Data hosting	3					2	1
Open cloud infrastructure		1					5
(Common) tech stacks				3		1	2
Anonymization	1	3			1	1	
Change management	2	2			1	1	
Code hosting	2		1	1		2	
Data lifecycle	1		2			1	2
Data quality		1	2		1	1	1
DevOps	1				1	2	2
Encryption		3	1			1	1
Interoperable solutions		3		1			2
OS code security		1	4			1	
Risk assessments	1		3			2	
Sandbox environments	3	1	1			1	
Scalability	1			1		2	2
Staff upskilling	5				1		
Standard operating procedures	2	2			1		1
Technical documentation	1	1		1	1	1	1
Technical support and maintenance	2	1			2		1
User manuals		1		1	3	1	

Standardization Grid – shows how often a card is placed in a category (absolutes)

OSEE Education, Training and Support Framework

- **Policy Development**: Creating guidelines
  adoption and contribution.
- **Community Engagement**: Building relati
  within the open-source community.
- **Technical Support**: Providing assistance f
  source projects.
- **Legal Compliance**: Ensuring adherence t
  legal requirements.
- **Training and Education:** Educating emplo
  practices and tools.
- **Governance:** Establishing structures for
  and compliance.
- **Partnerships:** Cultivating relationships w
  communities.
- **Communication:** Promoting open-source initiatives through effective
  communication.
- **Metrics:** Tracking and analyzing key performance indicators for open-
  source projects.



OSEE Framework will be **custom-tailored to selected countries**

Role of OSPOs in OSEE

- **Manages open-source software strategy** within organisations or entities.
- **Sets policies for using, developing, and contributing** to open-source projects.
- **Facilitates collaboration** between teams, partners, and the broader open-source community.
- **Provides guidance on** aspects of open-source software.
- **Promotes transparency, innovation, and community-driven** development.
- **Develops internal standards and best practices** for open-source technology.
- **Coordinates open-source initiatives** to align with organizational goals.

- Physically **placed in-country**, within a hosting institution
- Staffed **with local staff**, plus supported by local **host institution, consultants, UNDP and ITU**
- **Operational for 2 years**, with plans to ensure future **sustainability**
- Overseen by a **local project leader**, with coordination & project management globally from ITU and UNDP

Express of Interest Outreach and Impact

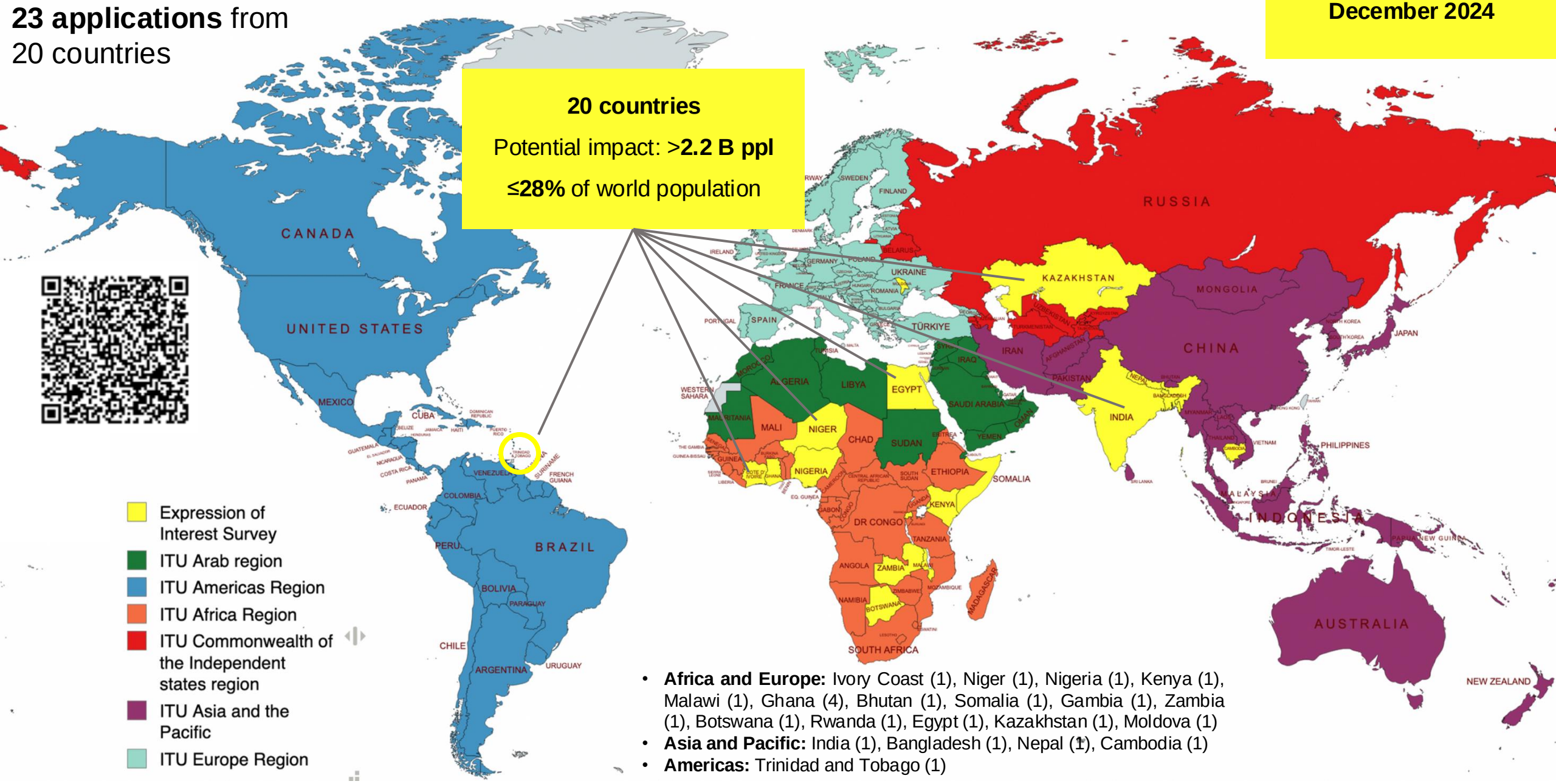
Selection outcome to be officialized late December 2024

23 applications from
20 countries

20 countries

Potential impact: >**2.2 B ppl**

≤28% of world population



- **Africa and Europe:** Ivory Coast (1), Niger (1), Nigeria (1), Kenya (1), Malawi (1), Ghana (4), Bhutan (1), Somalia (1), Gambia (1), Zambia (1), Botswana (1), Rwanda (1), Egypt (1), Kazakhstan (1), Moldova (1)
- **Asia and Pacific:** India (1), Bangladesh (1), Nepal (1), Cambodia (1)
- **Americas:** Trinidad and Tobago (1)

- Digital transformation strategy since 2014
- **Digital Egypt platform** based on open source
- **170** government digital services
- **16** sectorial platforms serving **+9.5M** users

- Everything open source
- **15-year** journey in digital government developments
- **+30 digital public services** implemented
- **+14M active users**

- Open source practices **since 20+ y**
- **Growing open source** ecosystem
- Supports **12 countries** (mostly from Africa and Asia) in their open source developments
- **3'000+ digital public services** used by **+15M users** a month

OSEE – Country Selection Process

Open Call Outreach

+7k impressions on social media

194 Administrations of ITU Member States, Palestine (Resolution 99),

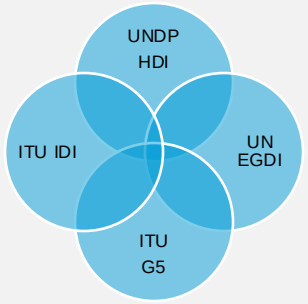
186 Permanent Missions (as not all administrations have a PM)

6 ITU Regional Offices

170 UNDP digital focal points

+4500 ppl (internal and external) thanks to UNDP's newsletter.

1 Societal, Regulatory and Digital pre-analysis



4 major UN indicators

- Human Development Index (HDI) United Nations Development Programme
- e-Government Development Index (EGDI) United Nations ECOSOC
- G5 Benchmark ITU
- ICT Development Index (IDI) ITU

2 EoI Open Call

22 questions

- Exploration and usability of OS in gov
- Strategic analysis of OS ecosystem
- Understanding of OSPOs

23 applications from 20 countries

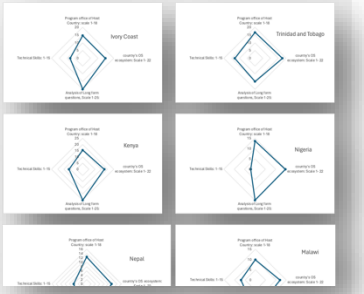
All regions of the world

3 Technical Assessment

11 questions

- Current state and ownership of OSS
- OSEE Framework modules prioritization
- Support needs and preferences
- Training and resources availability
- Availability of a team to receive training

4 Countries Interviews



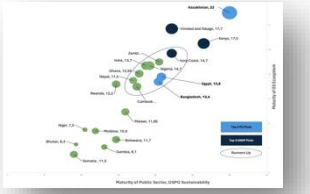
6 countries interviewed

- 6 shortlisted (3 ITU picks, 3 UNDP picks)
- Semi-structured interviews

2 pilots proposed

2 backups shortlist

+8 affiliates list



More info:

Country Analysis & Selection (BCG Matrix)

DIMENSIONS OF MEASUREMENT

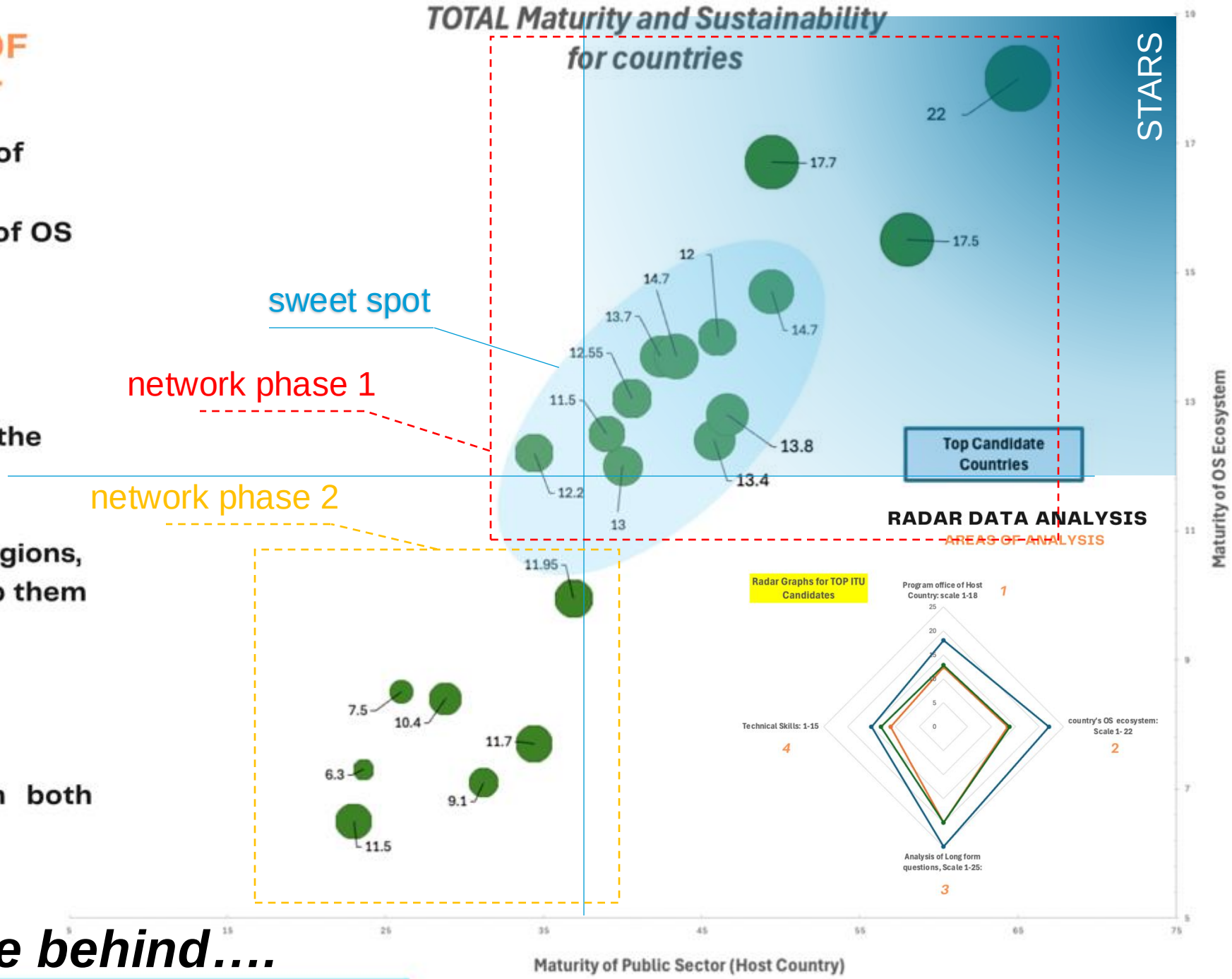
1. X-Axis: Maturity of Public Sector
2. Y-Axis: Maturity of OS Ecosystem

BLUE ZONE

The 'blue zone' were the countries that have potential to become champions in their regions, our focus was to help them out.

SELECTION

3-5 top picks from both ITU, and UNDP



Leave no one behind….

Deploying a UN-backed international network

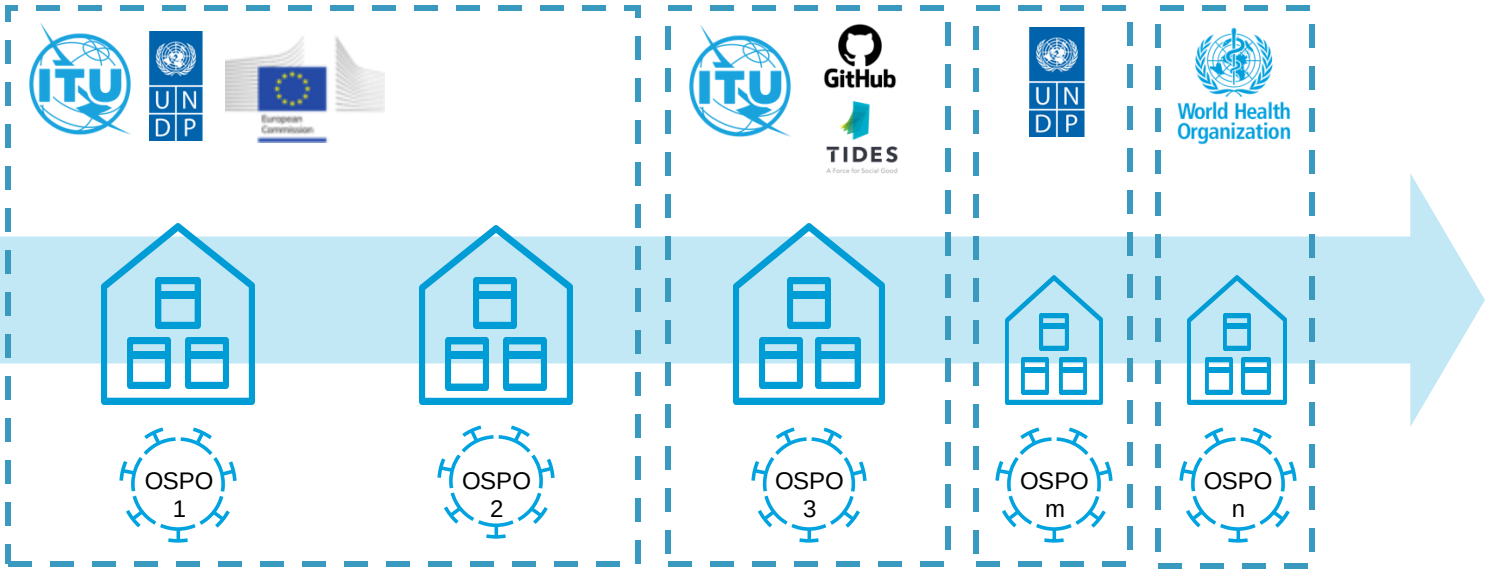
To **create and support an international network** of OPSOs backboning countries and agencies

To **replicate the framework model and facilitate** future OPSOs implementations

To gear toward an **international governance** of OSPOs and strategic agenda

To **scale and sustain knowledge and lessons learned** from all OSPOs

To **share globally,** maintain and disseminate in a sustainable manner



done
ongoing
planned

Appendix 2. Indicative Work Plan

Project starts in Q3/2023	Year 1				Year 2				Year 3 (18 months)						Responsible
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Project Setup and Management															
Setup															Shared
Recruitment of project staff															Shared
Steering Committee meetings															ITU
Output 1: Open-Source Ecosystem Enablement Development Framework															
1.1. Framework development preparatory work															Shared
1.2. Framework development															Shared
1.3. Framework publication and dissemination															Shared
Output 2: National Open-Source Ecosystem Enabler for Public Services Innovation (Open-source Tech Facility) established in selected countries															
2.1. Identify and select target countries															Shared
2.2. Detailed country assessment & selection of OSTF host															Each OSTF
2.3 Recruitment of Project Officers															Each OSTF
2.4. Build capacity of the national OSTF (recruit staff)															Each OSTF
2.5. Deliver OSTF services															Each OSTF
Output 3: Global Open-Source for Public Services ecosystem Enablement Knowledge Hub established															
3.1. Develop knowledge and training materials/products															Shared
3.2. Globally disseminate knowledge and lessons learned															ITU
3.3. Establish and sustain a global knowledge Hub															ITU

Make an impact…

OSPOs deployment

Interim deliverables:

- Project visual identity
- Project website
- 4 thematic webinars
- 2 planned workshops
- 1 project launch event
- 1 joint Web news
- 2 draft case-studies
- 9 intl. OS experts
- 1 draft framework
- 1 draft Open Call EoI

OSEE Advisory Group

- Provide guidance on project activities.
- Advise on issues and problems arising from project implementation, submitted for consideration by the project coordinator.
- Facilitate cooperation between all project partners and stakeholders.
- Facilitate collaboration between the Project and other relevant programmes, projects and initiatives.
- Representatives of ITU, the EC, UNDP and other stakeholders, including UN agencies and other project implementation partners.
- The ITU Project Coordinator will form the secretariat of the AG together with the UNDP Project Officer, with ITU, UNDP and EC acting as co-chairs.
- Meets (virtually or in person) at least once a year.
- The recommendations of the AG, taken by consensus, will only be of advisory nature.

+ new experts roster to open…

Advisory group to be <u>used to involve important/expert</u> community stakeholders

Feedback on OSEE framework and OSPOs

… indicative potential contributors …

Open Source Ecosystem Enabler

Building digital public services for impact

David Manset
International Telecommunication Union (ITU)

Michael Downey
United Nations Development Programme (UNDP)

Obaloluwa Ajiboye
United Nations Development Programme (UNDP)

#OSEE

What's coming up next?

- **2024Q4:** Selection & preparation of pilot countries, implementation planning
- **2025Q1**: Staffing and launch of OSPOs, production of training materials
- **2025Q1:** OSPO setup and framework personalization in selected countries
- **2025Q2:** OSPOs fully functional, in-country work commences for 2 full years of support

Questions?

ARTIFICIAL INTELLIGENCE

Dr David Manset– *Senior Project Coordinator OSEE/ITU*

OPEN SOURCE AT THE UN

novembre - 2024

Open Source United

Common Policy Framework

Release Candidate 1 (RC1), November 2024

opensource.un.org

Open Source Ecosystem Enabler

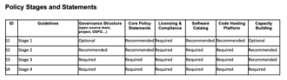
Building digital public services for impact

ITU

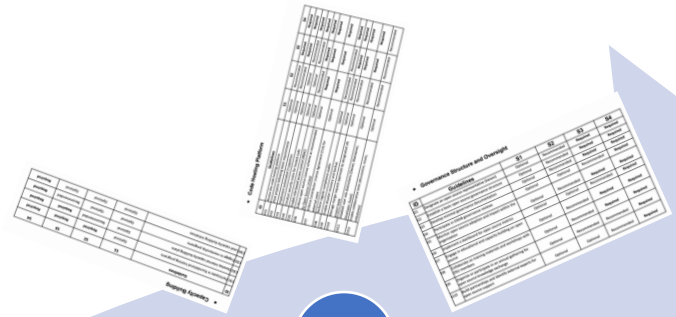
UNDP

Funded by the European Union

OSU – Common Policy Framework



4-stage engagement model to guide UN organizations



19 core policy statements, structured around **5 pillars**

- Governance
- Software catalog
- Code hosting
- Capacity building
- Legal & compliance

35 guidelines

4 Foster Inclusive Participation and Community Building

3 Secure by Design

2 Contribute Back

1 Open by Default

5 Design for Reusability - White Labeling

6 Provide Documentation (using, implementing, developing, managing)

7 RISE (Recognize, Incentivize, Support, and Empower)

8 Sustain and Scale

Open Source Strategic Implementation Board (OSSIB)

due diligence & support

OSPO OSSIB | OSPO OSSIB | TEAM OSSIB | PROJ

OSU Recommendations	UN Org	Role	Coordinator(s)
Common Policy Framework	ITU	Lead Author and Coordinator	David MANSET
	UNICEF	Co-lead Author	Vipul SIDDHARTH
Software Catalog	UNFPA	Lead Author and Coordinator	Mostafa ELKORDI
Code Hosting Platform	UNICC	Lead Author and Coordinator	Massimiliano FALCINELLI
Licensing & Compliance	IAEA	Lead Author and Coordinator	Rina AHMED
	WHO	Co-lead Author and Coordinator	Catharina MARACKE
	UNICEF	Co-lead Author and Coordinator	Vipul SIDDHARTH
Capacity Building	UNOICT	Lead Author and Coordinator	Omar MOHSINE

ARTIFICIAL INTELLIGENCE

Dr David Manset– ***Senior Project Coordinator OSEE/ITU***

MORE INFO

novembre - 2024

Public Data Stewardship, Governance and Analysis: Empowering Expertise in Open-Source Environments

9 webinars

3 case-studies

14 conferences

20+ organizations

September 5, 2024

TechLearnTalk - An Introduction to Open Source

UN Entity:

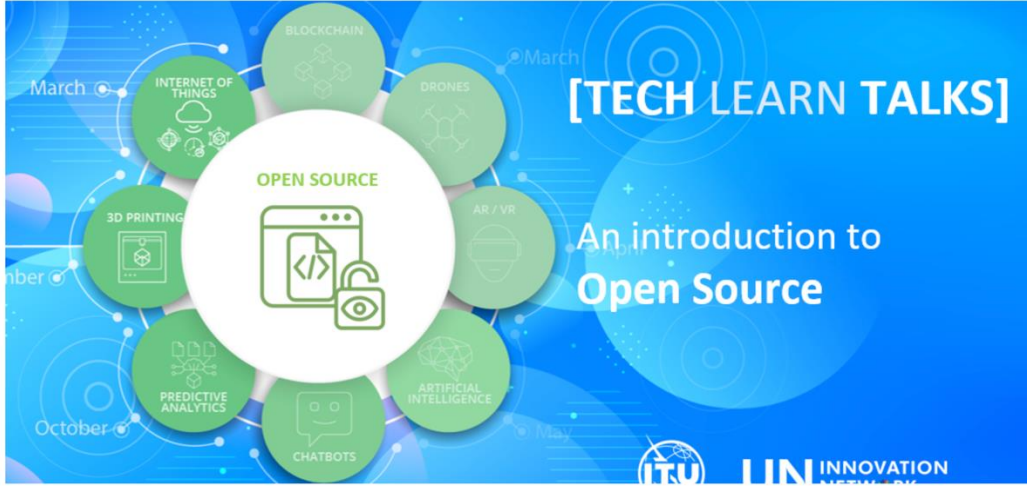
UNIN
ITU
UNICEF

SDGs:

All

Innovation Area:

Digital Transformation
Data Innovation
Mobile Phone-based Innovations



This session of our TechLearnTalks series explores open source, the opportunities and risks associated with it, and how it can be used for the work of the UN. In this session, we are joined by speakers from the UNICEF for a non-technical introduction to open source and from ITU for an example of how ITU is supporting governments to leverage open source and how the UN is coming together around it. TechLearnTalks, which introduce technologies to a non-technical audience, aim to demystify a range of new technologies, such as blockchain, metaverse, predictive analytics, and VR, and showcase how they can be leveraged for the work of the UN.

View Recording → | View Resource →

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27 June 2024

AIntuition: Unlocking Efficiency for Public Sector with Retrieval Augmented Generation Applications

14:00 - 15:00 CEST Geneva | 08:00-09:00 EDT, New York | 20:00-21:00 CST, Beijing

Ronnie Ochieng (Kenyatta University), Victor Olufemi (Chemotronix), Vincent Peres (Berexia)...

Discovery - Open Source AI for Digital Public Goods

VIEW DETAILS

31 May 2024

Unleashing the power of open-source AI: Transforming digital public services for a better tomorrow

08:30 - 12:15 CEST Geneva

Alejandra Lagunes (Republic of Mexico), Cosmas Luckyson Zavazava (ITU), Noémie Bürkl (BMZ)...

Discovery - Open Source AI for Digital Public Goods, Workshop

VIEW DETAILS

24 April 2024

AIntuition: Unlocking Efficiency for Public Sector with Retrieval Augmented Generation Applications

14:00 - 15:00 CEST Geneva | 08:00-09:00 EDT, New York | 20:00-21:00 CST, Beijing

David Manset (ITU), Thomas Basikolo (ITU), Vishnu Ram OV (Consultant)...

Discovery - Open Source AI for Digital Public Goods

VIEW DETAILS

28 March 2024

Innovating Education: Navigating Challenges in Open-Source (Generative) AI Integration

14:00 - 15:00 CET Geneva | 09:00-10:00 EDT, New York | 21:00-22:00 CST, Beijing

David Manset (ITU), Fengchun Miao (UNESCO), Märt Aro (DreamApply.com)...

Discovery - Open Source AI for Digital Public Goods

VIEW DETAILS

18 January 2024

Open Source (generative) AI for Public Services Innovation

14:00 - 15:15 CET Geneva | 08:00-09:15 EST, New York | 21:00-22:15 CST, Beijing

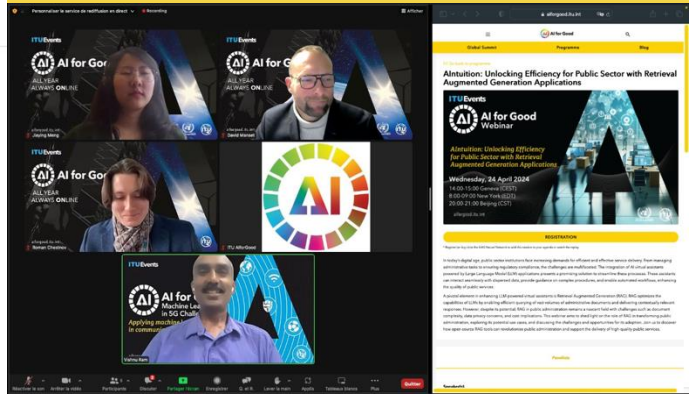
Alejandra Lagunes (Republic of Mexico), David Manset (ITU), Jovan Kurbalija (DiploFoundation)...

Discovery - Open Source AI for Digital Public Goods

VIEW DETAILS

AI for Good Discovery

Open Source AI for Digital Public Goods



AI for Good | AI-RELATED FOCUS GROUPS & INITIATIVES

AI for Health
ITU-WHO Focus Group

World Health Organization

AI and Internet of Things for Digital Agriculture
ITU Focus Group

AI for Natural Disaster Management
ITU Focus Group

WORLD METEOROLOGICAL ORGANIZATION + UN environment programme

Machine Learning and 5G
ITU Focus Group

AI for Environmental Efficiency
ITU Focus Group

AI and Data Commons
Global Initiative

AI for Road Safety
Global Initiative

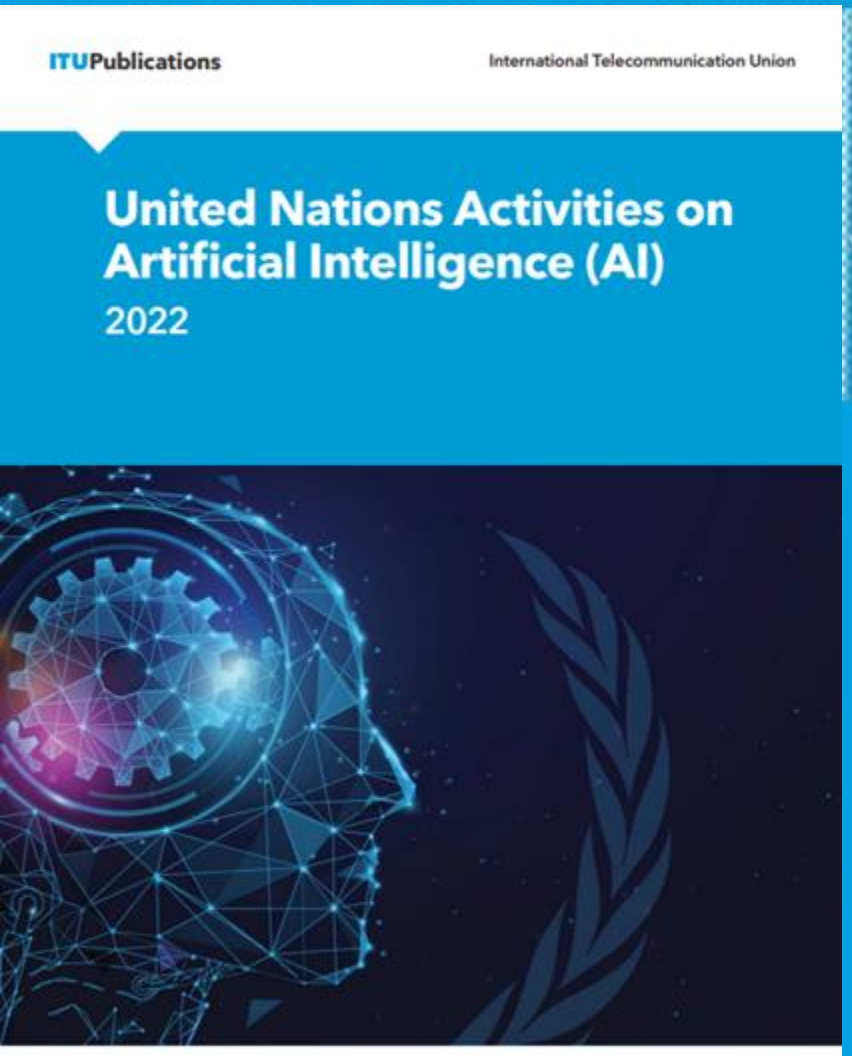
=

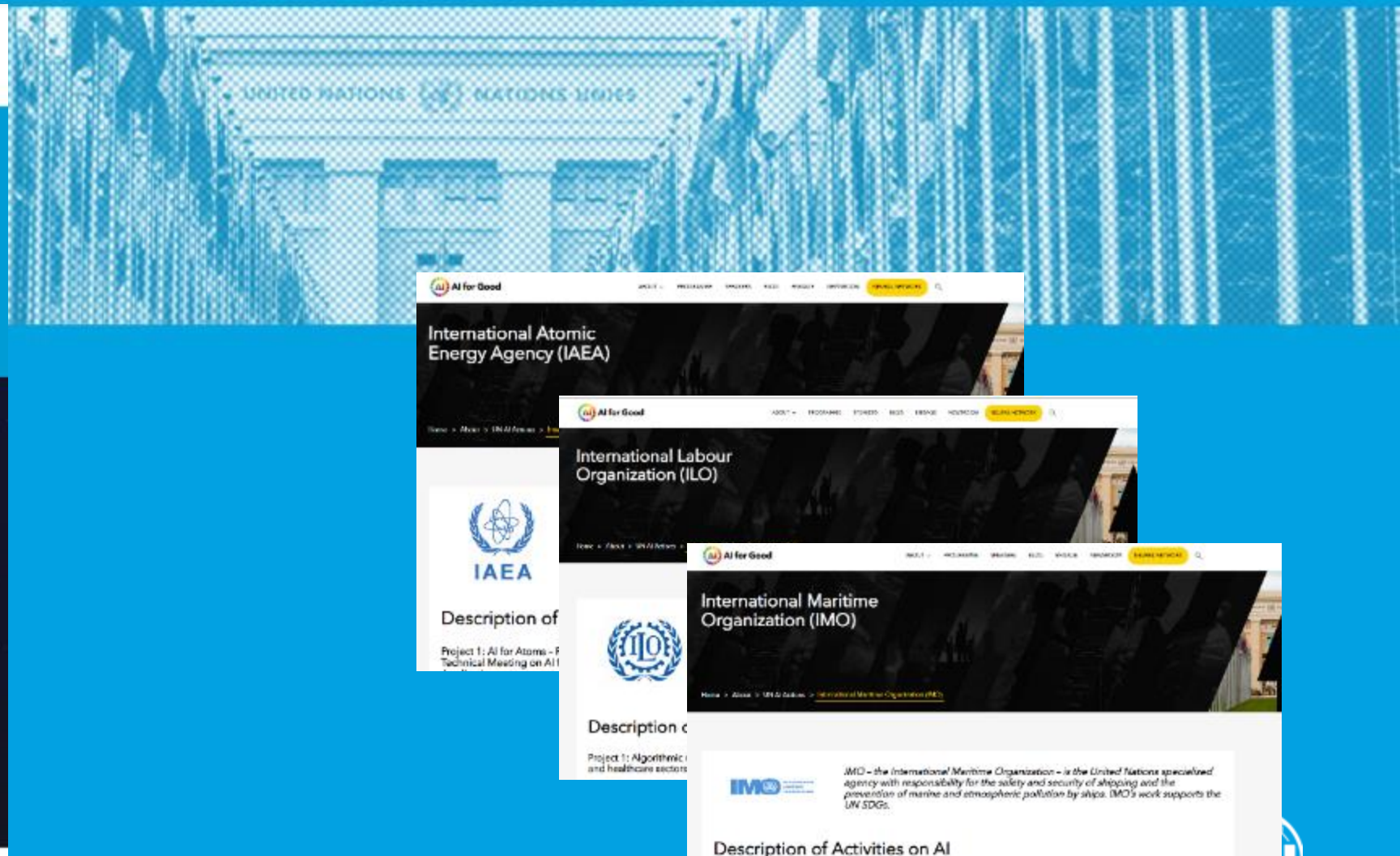
AI for Autonomous and Assisted Driving
ITU Focus Group

+ UN Special Envoy for Road Safety + UN Envoy on Technology

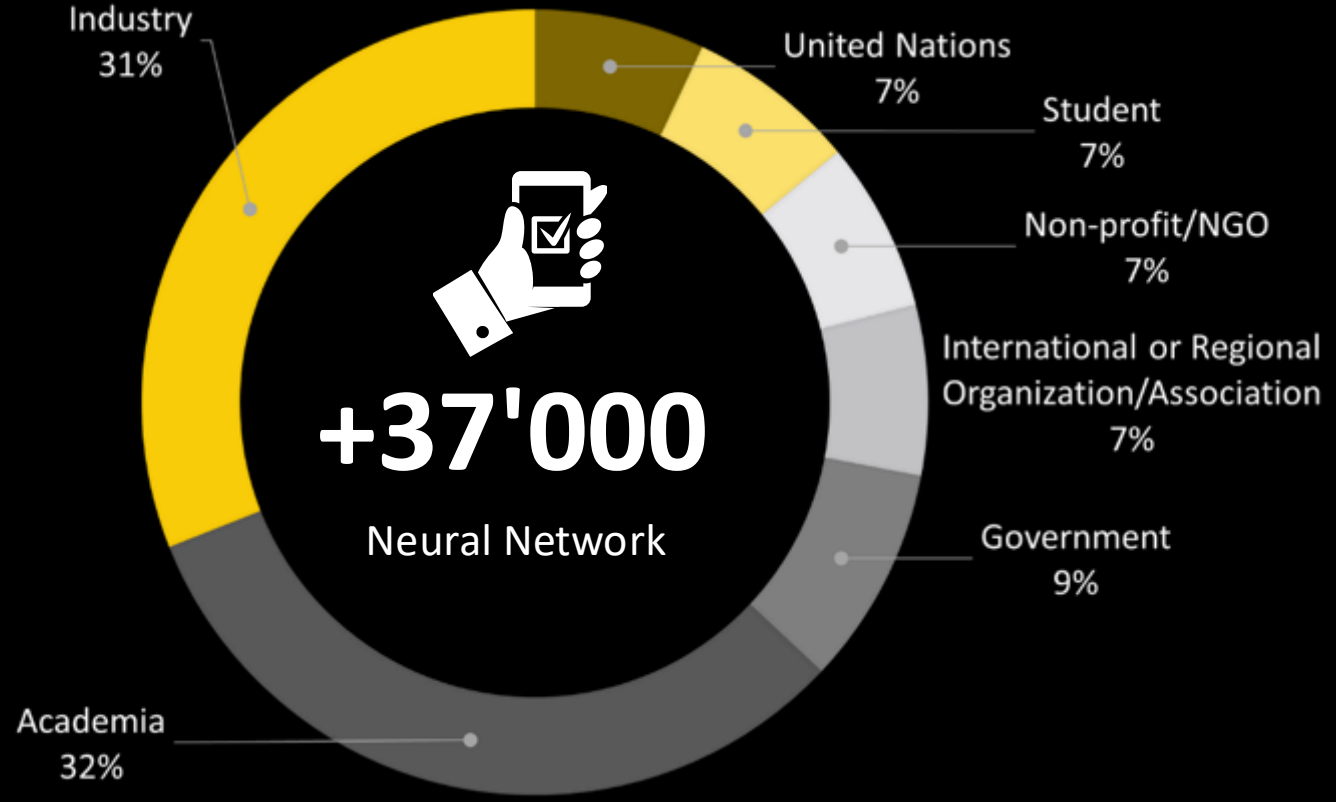
ITU

AI for Good | United Nations Activities on Artificial Intelligence (AI)





AI for Good | Neural Network



Download on the App Store

GET IT ON Google Play


you next year!
2025
AI for Good
Global Summit
5’000+ attendees
The UN's flagship event on AI in Geneva
8 -11 July 2025 @ Geneva

AI for Good | What they say about us

*"**AI for good is the flagship platform on AI for the UN system**"*

- Alexander Fasel, Swiss State Secretary

"When AI for Good began as a vision, it transformed into a mission. We need to empower AI for Good to harness the full potential of AI for the betterment of our world."

- Ebtesam Almazourei, Chair AI for Good Impact Initiative, Founder and CEO at AIE3

*"Bangladesh is not currently part of any of [the global] processes we are worried of [...] being left behind. This is where the **ITU and platforms like AI for Good play a crucial role in democratizing the conversation**."*

- H.E. Mr. Zunaid Ahmed Palak, Minister, Ministry of Posts, Telecommunications and Information Technology, Bangladesh

*"How can we make sure that the use of AI benefits humanity? It's this essential question that is at the heart of the AI for Good Global Summit, which brings us together today in Geneva, and which throughout the year constitute the **largest multilateral platform in the UN system for AI**"*

- Alfonso Gomez, Mayor
Ville de Genève

"What I've really seen is the fact that we can really effect amazing change, but we have to do this together [...] and that's what makes me so excited about what AI for Good is all about. Being here today seeing what innovation in practice really looks like, I'm even more inspired that together we can bring together a collective change for good"

- HRH Princess Beatrice, United Kingdom

"We are all in this room because we care about the direction the future goes."

- Tristan Harris, Co-Founder & Executive Director at Center for Humane Technology (CHT)

AI for Good

Less than 6 years remain to solve the UNSDGs

"We need Global coordination to build safe and inclusive AI that is accessible to all. I wish to recognize the International Telecommunication Union's early expertise on AI standards and thank you for convening this important meeting on AI for development."

António Guterres
Secretary-General, United Nations

"It's time for us to recognize that the AI Revolution is our moment. It's truly our moment because we are the AI generation and it's our responsibility to write the next chapter in the great story of humanity and technology."

Doreen Bogdan-Martin
ITU Secretary-General


THE TIME IS NOW!
#AIforGood
aiforgood.itu.int
ITU