

# LF AI Meetings

August 20, 2019

San Diego

 THE **LINUX** FOUNDATION

 **LF AI**

# Schedule

9:00am - 10:00am	<b>LF AI - Overview and ongoing efforts</b> Ofer Hermoni (Amdocs) and Ibrahim Haddad (LF AI)
10:00am - 10:30am	<b>Angel 3.0</b> Fitz Wang (Tencent)
10:30am - 10:45am	<b>Break</b>
10:45am - 11:15am	<b>ML Workflows: End to end AI and ML Pipelines on Container Platforms</b> Animesh Singh (IBM)
11:15am - 11:50am	<b>Acumos: Boreas and Beyond</b> John Murray (AT&T)
11:50am - 12:20pm	<b>Ethics in AI: Detecting and remediating bias in AI</b> Animesh Singh (IBM)
12:20pm - 12:30pm	<b>Open Discussion</b>

# LF AI Foundation

## Overview and Ongoing Efforts

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ED, LF AI Foundation  
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Ofer Hermoni, Ph.D.  
Senior Director, CTO Office, Amdocs  
Chair, LF AI TAC

# Agenda

Introduction

LF AI Foundation

Data related projects

Workgroups and ongoing efforts

Hosting a project in LF AI

Getting Involved

# Introduction



We are creating a sustainable open source AI ecosystem that makes it easier to create AI products and services using open source technologies.

# Today the Linux Foundation is much more than Linux



## Security

We are helping global privacy and security through a program to encrypt the entire internet.



## Networking

We are creating ecosystems around networking to improve agility in the evolving software-defined datacenter.



## Cloud

We are creating a portability layer for the cloud, driving de facto standards and developing the orchestration layer for all clouds.



## Web

We are providing the application development framework for next generation web, mobile, serverless, and IoT applications.



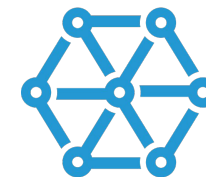
## Blockchain

We are creating a permanent, secure distributed ledger that makes it easier to create cost-efficient, decentralized business networks.



## Automotive

We are creating the platform for infotainment in the auto industry that can be expanded into instrument clusters and telematics systems.



## AI

We are creating a sustainable open source AI ecosystem that makes it easier to create AI products and services using open technologies.



# The Linux Foundation and Other Orgs Continue to Grow

**1400+**

Members From  
41 Countries



**80%**

of Fortune 100  
Tech & Telecom



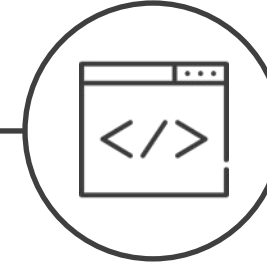
**35,000+**

Developers  
Contributing Code



**170+**

Open Source  
Projects



**\$16B**

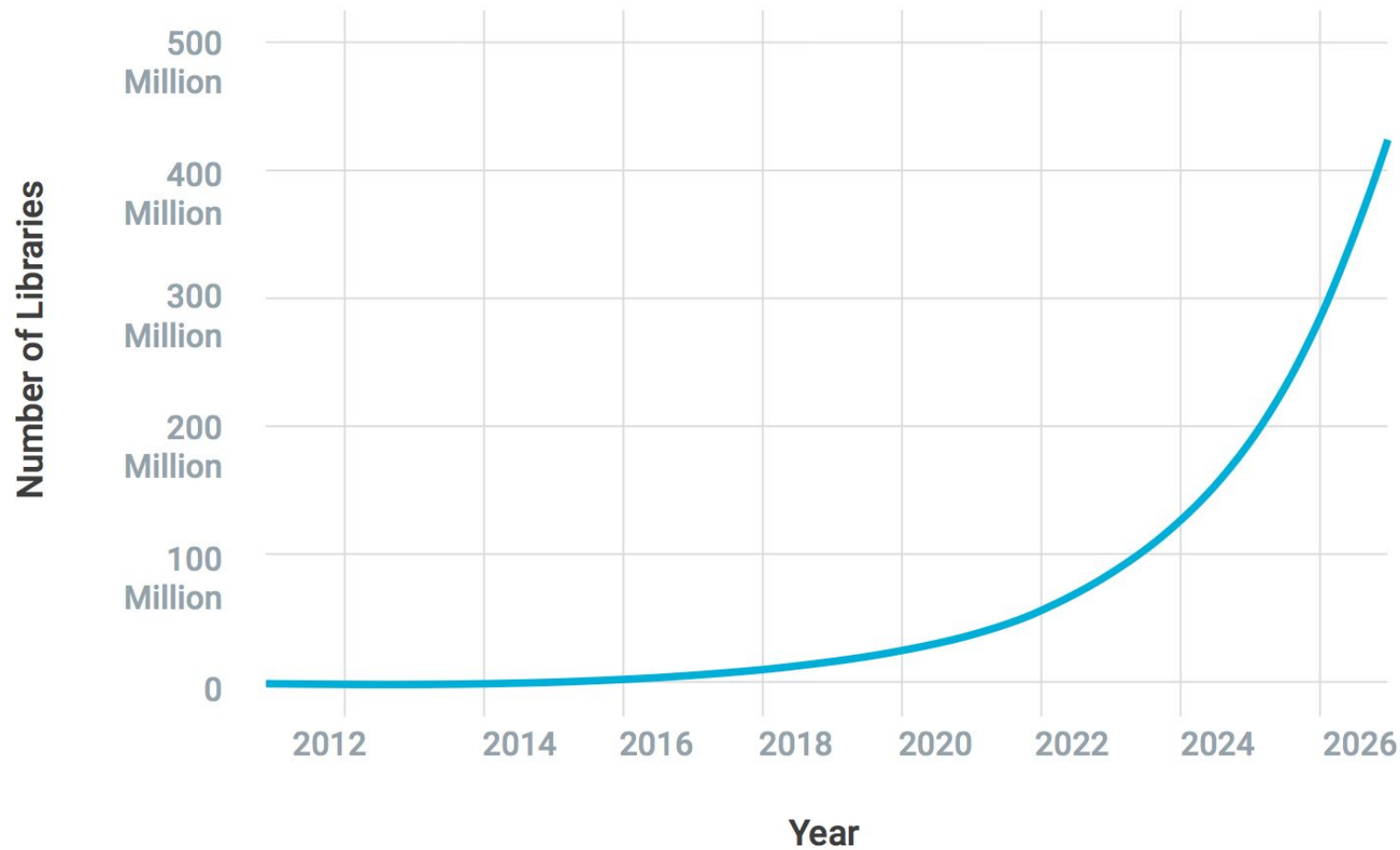
Shared  
Value



We have seen unprecedented growth in our projects

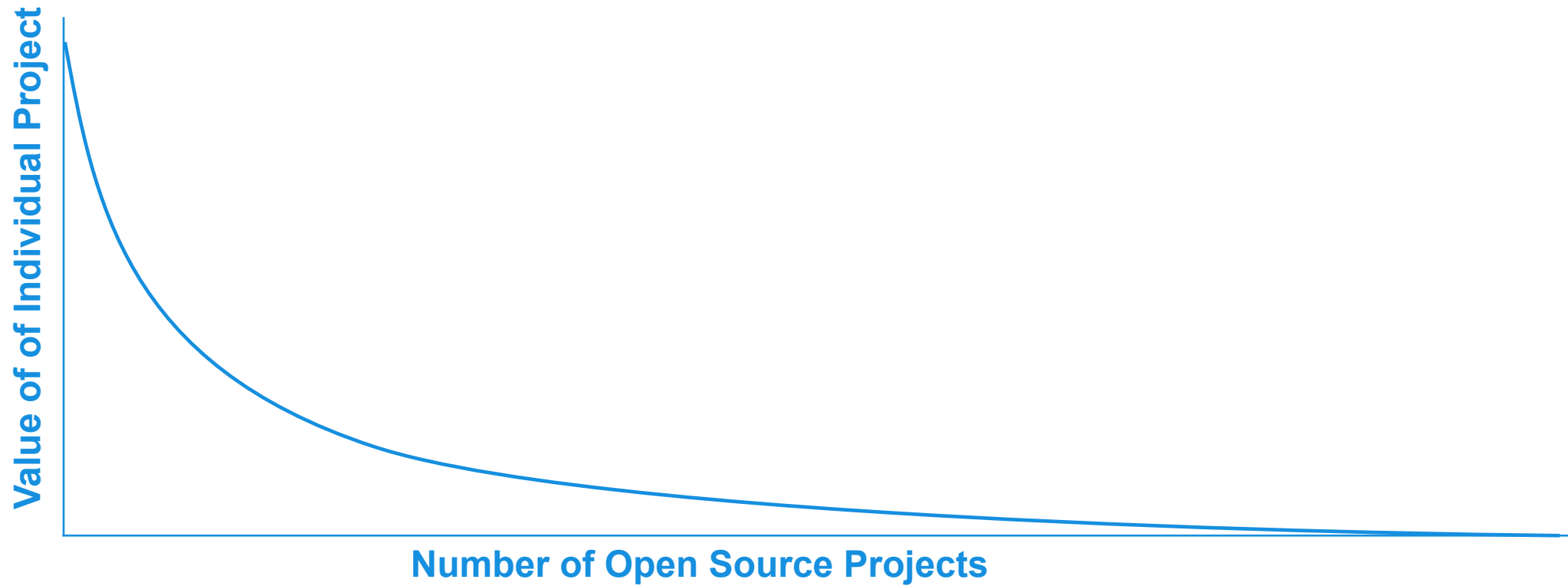


# Open Source Isn't Slowing Down Any Time Soon

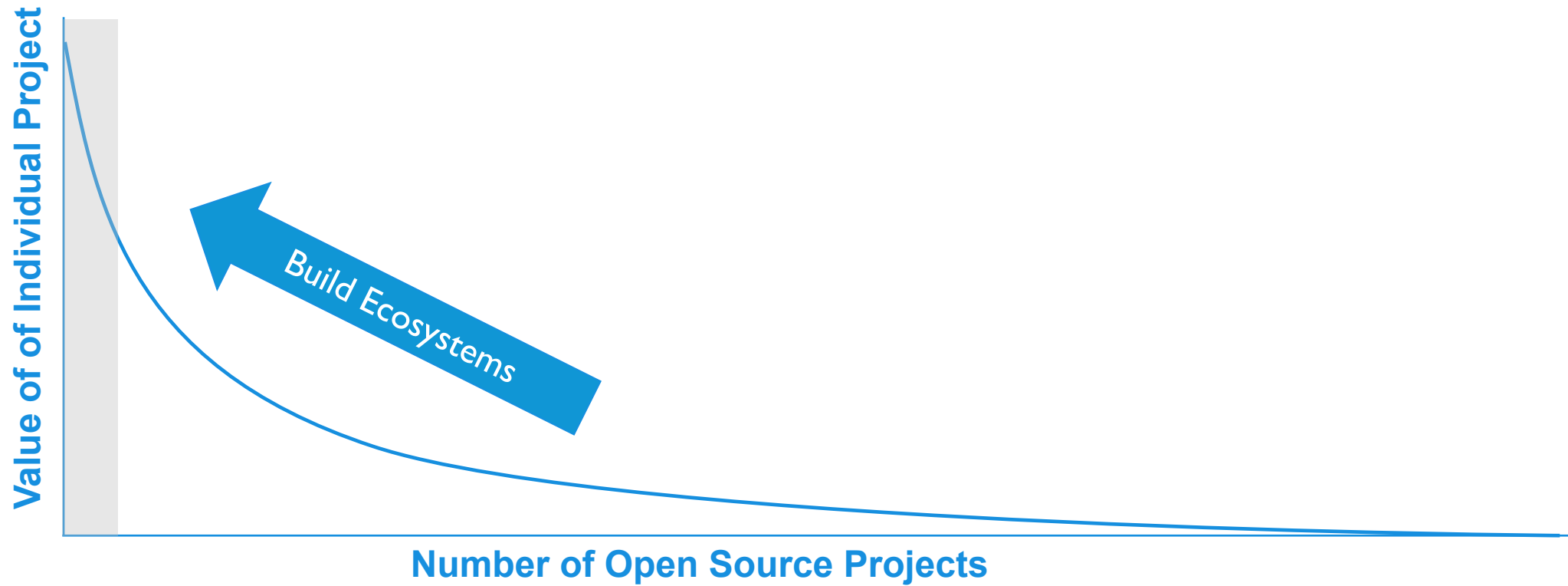


[:] SourceClear

# The Real Question is Which Projects Matter?

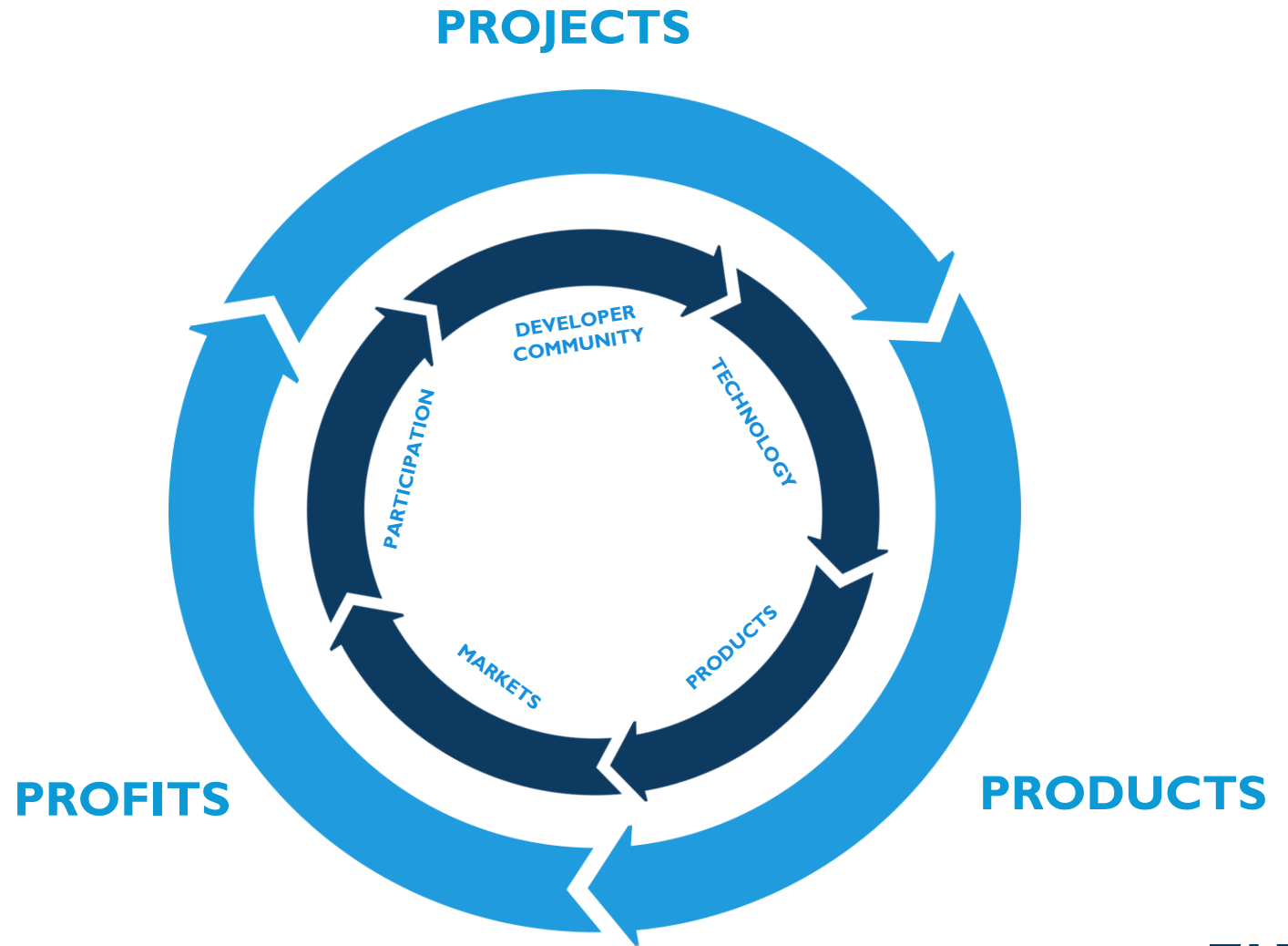


# LF seeks to accelerate new projects to adoption and sustainability



# The Answer: Projects With Sustainable Ecosystems

Sustainable projects have a developer community whose technology is used in commercial solutions that profit businesses, who in turn participate and reinvest back into the project and hire developers to work in the community.



# Creating sustainable open source projects requires **real work**

Governance and Membership	<ul style="list-style-type: none"><li>• Incorporation, Tax status, Bylaws, Member Agreements, Anti-trust, etc.</li><li>• Ongoing business development and membership recruitment</li></ul>
Development Process	<ul style="list-style-type: none"><li>• Technical Decision Making</li><li>• Project Life Cycle</li><li>• Release Process</li></ul>
Infrastructure	<ul style="list-style-type: none"><li>• Custom infrastructure using open source best practices</li><li>• Security and reliability</li></ul>
Ecosystem Development	<ul style="list-style-type: none"><li>• Marketing</li><li>• Events</li><li>• Training</li></ul>
IP Management	<ul style="list-style-type: none"><li>• Code Provenance and License compliance</li><li>• Trademark management</li><li>• Legal defense and Collaboration</li></ul>

**Projects**  
**963,000+ GitHub Stars**

9

## Categories

67

**Organizations**  
**Market cap of \$6.31T**

## Universities

10

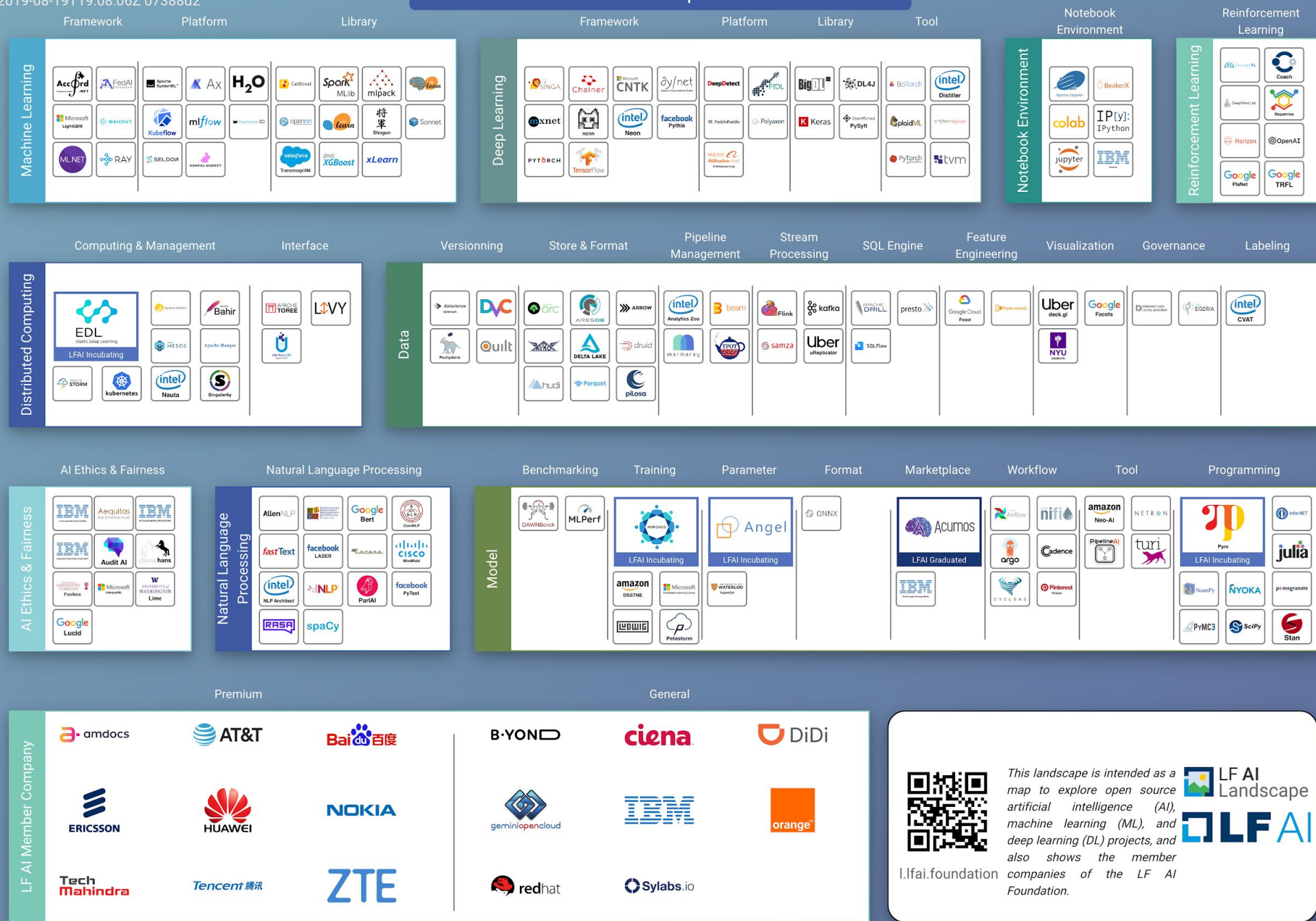
## Open Source Licenses

**l.fdl.io**

Linux Foundation AI Landscape  
2019-08-19T19:08:06Z 07388d2

See the interactive landscape at [l.lfai.foundation](http://l.lfai.foundation)

Greyed logos are not open source



You are currently tracking **355,762,809 lines of code**,  
committed by **30,204 developers**,  
from **282 known organizations**,  
working in **240 repos**, on **178 projects**  
over the last **5 years, 7 months, and 14 days**.

# The LF AI Foundation

Web site: <https://lfdl.io>

Landscape: <http://l.lfdl.io>

GitHub: <https://github.com/LFDLFoundation>

Wiki: <https://wiki.deeplearningfoundation.org>



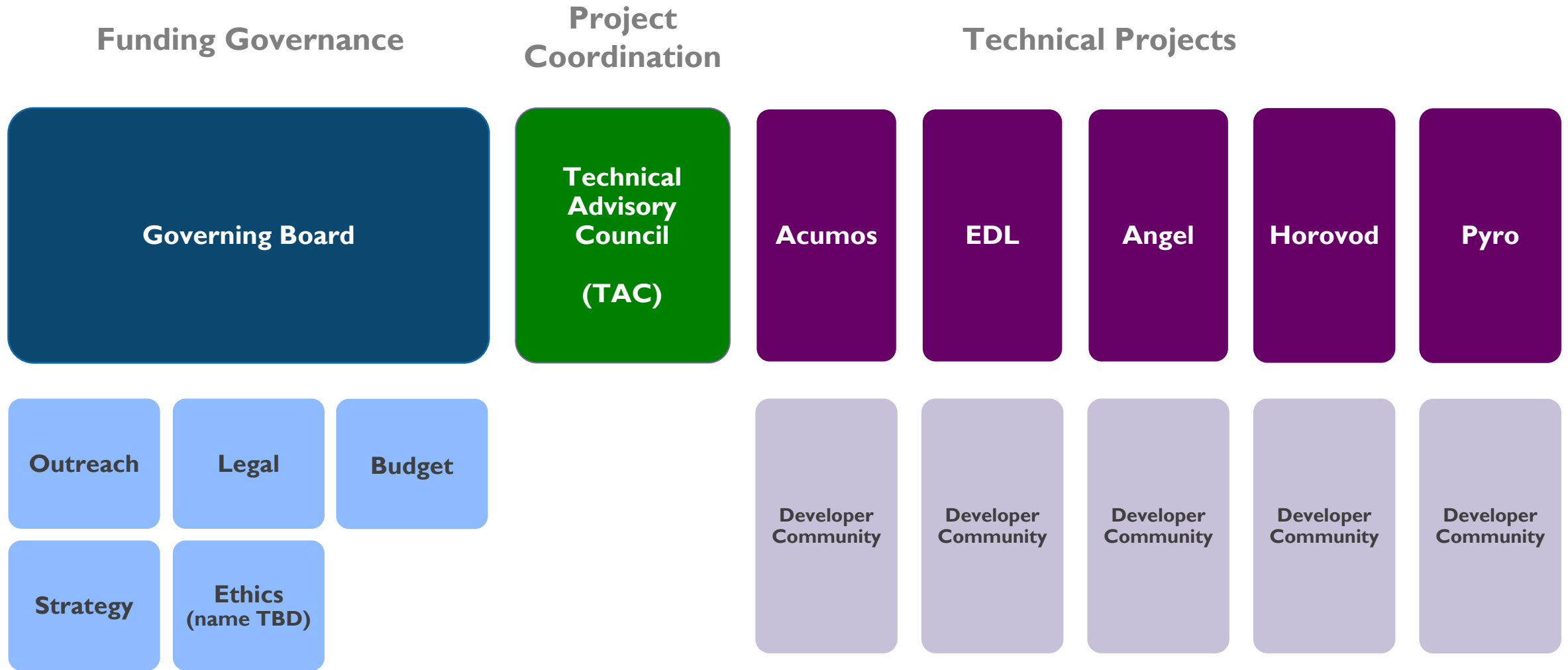
# What is the LF AI Foundation?

- LF AI is a an LF umbrella foundation founded in March 2018 to support collaboration and open source innovation in the AI, ML, and DL domains
- LF AI members are collaborating to create a neutral environment with an open governance for harmonization and acceleration of separate technical projects focused on AI, ML, and DL technologies

# Governance

- › LF AI is a single funding effort to support technical projects hosted under the Foundation
- › Technical projects have their own technical governance following our principle of separation of technical governance from funding governance
- › The Foundation's Charter is available from <https://lfdl.io>

# Structure



# Mission

Build and support an open AI community, and drive open source innovation in the AI, ML and DL domains by enabling collaboration and the creation of new opportunities for all the members of the community

# Goals

## Neutral Environment

Provide an neutral environment and an open governance that fosters collaboration and cross-pollination

## Harmonization, Interoperability

Increase efforts to harmonize AI/ML/DL open source projects and reduce fragmentation; increase the interoperability among projects

## Ethics and Fairness

Become the home of open source AI efforts in ethics and fairness, and an advocate for these principles

## Data, Models Tools and Marketplace

Host open source models with supporting tools; publish best practices; offer a marketplace for AI/ML/DL models

## Funding and Awareness

Provide a funding model for key projects; increase awareness

# Members

## PREMIER MEMBERS



## GENERAL MEMBERS



# Projects



Machine learning platform and marketplace for ML models.

Contributed by AT&T



A high-performance distributed ML platform based on Parameter Server, running on YARN and Apache Spark.

Contributed by Tencent



A framework designed to help DL cloud service providers to build cluster cloud services using different DL frameworks.

Contributed by Baidu



Distributed training framework for TensorFlow, Keras, and PyTorch.

Contributed by Uber



Pyro is a universal probabilistic programming language written in Python and supported by PyTorch on the backend.

Contributed by Uber

# Universities Contributing to LF AI Projects

- Georgia Tech
- University of British Columbia
- Stanford University
- MIT
- Harvard University
- Oxford University
- Penn University
- NYU
- Florida State University
- University of Copenhagen



# LF Data Related Projects

# Community Data License Agreement

[cdla.io]

**Goal** - Establish the framework for collaborative sharing of data

**CDLA-Sharing** - Designed to embody the principles of copyleft in a data license. In general, if someone shares their data, the CDLA-Sharing agreement puts terms in place to ensure that downstream recipients can use and modify that data, and are also required to share their changes to the data.

**CDLA-Permissive** - Similar to permissive open source licenses in that the publisher of data allows anyone to use, modify and do what they want with the data with no obligations to share any of their changes or modifications

# Data Practices

[\[datapactices.org\]](https://datapactices.org)



## Data Values & Principles

These values and principles, taken together, describe the most effective, ethical, and modern approach to data teamwork.



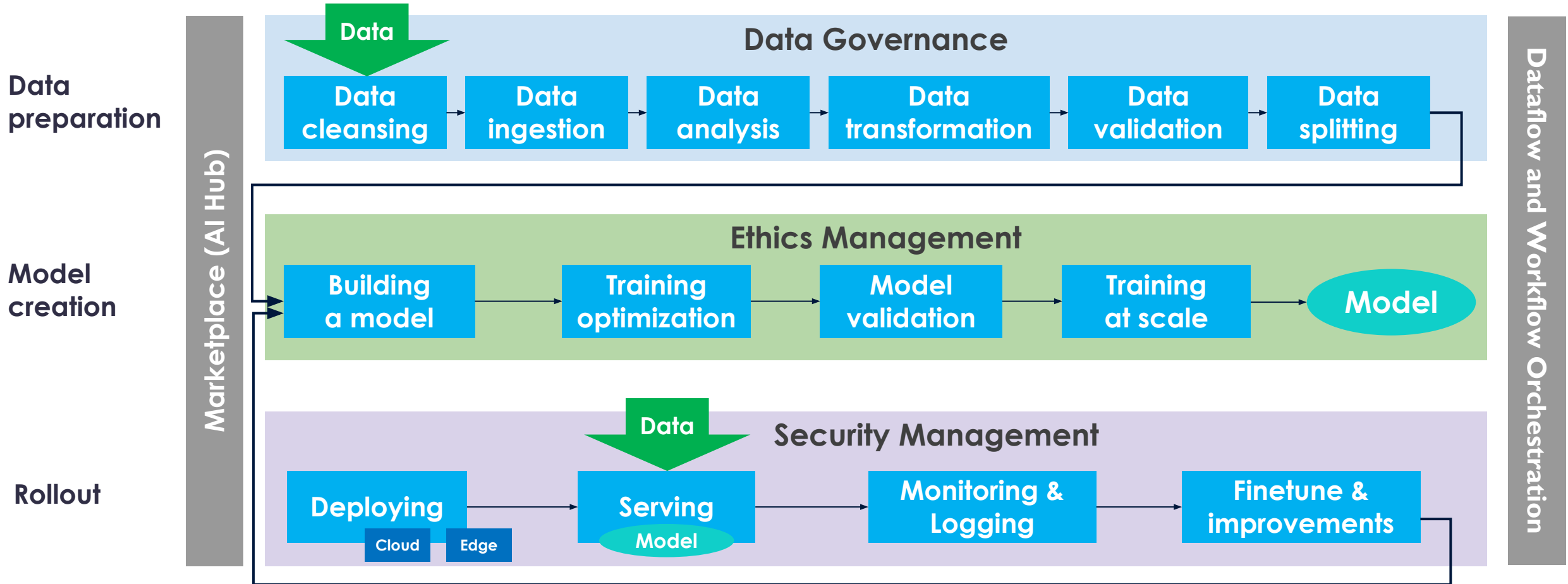
## Data Practices Courseware

Consume and collaborate on free and open courses designed to help everyone from the novice to the expert data practitioner.

# Work Groups and Ongoing Efforts

# LF AI - ML Workflow

Reference workflow and implementation



# LF AI - Ethics

- › **Focus** - Fairness, robustness, explainability, and lineage
- › **Policies, guidelines and tooling**
- › **Documentation** - Content that describes the basic concepts and definitions in relation to AI Ethics in an effort to standardize the vocabulary and terminology
- › **Certification** - A certification or badging program for open source projects that meet the AI Ethics policies and guidelines as defined by LF AI
- › **Explore possible training opportunities**

# LF AI Strategy

- Revisit and redefine the scope/mission of LF AI to be above and beyond current set of projects and operationalization of LF AI projects
- Define, document and promote the key value propositions of LF AI
- Define scope and inter-working of LF AI with other LF communities
- Define the key communities for contributions

# Cross Collaboration Opportunities

[LF Edge](#): Trusted AI is needed in edge devices, from driverless vehicles to smartphones to automated factories and farms. Industry fragmentation is a major challenge for edge development. LF Edge brings together projects across Internet of Things (IoT), cloud, and enterprises to increase unity across platforms, communities, and ecosystems. LF Edge fosters collaborations with end users, vendors, and developers to transform all aspects of edge technology and speed open source development.

[LF ODPi](#): Data is at the heart of building open source trusted AI systems – and data governance is especially needed. ODPi provides one of the only vendor neutral, open source standards to enable best practices for data governance, connectivity, business intelligence, analytics, and AI systems.

[LF Energy](#): The energy industry needs open source trusted AI across a wide range of business processes, from predicting demand to predictive maintenance of equipment and more. LF Energy provides a vendor-neutral, collaborative environment to “enable the electrification of everything to scale,” thereby transforming the world’s relationship to the important resource of energy.

[LF ONAP](#): Trusted AI embedded in the network is a priority for the communications industry. The Open Network Automation Platform (ONAP) is ready to be infused with AI to enhance real-time, policy-driven orchestration and automation of physical and virtual network functions. Communication industry providers and developers can use open source to rapidly automate new services and support complete lifecycle management.

[LF CNCF](#): The need for trusted AI In the cloud is the dominate way AI capabilities will be accessed for enterprise business processes. The Cloud Native Computing Foundation (CNCF) hosts critical components of the global technology infrastructure.



# Hosting a Project in LF AI

# LF AI Project Hosting Requirements

The project must:

- Use an approved OSI open source license
- Be supported by a LF AI member
- Fit within the mission and scope of LF AI
- Allow neutral ownership of project assets such as a trademark, domain or GitHub account (the community can define rules and manage them);
- Have a neutral governance that allows anyone to participate in the technical community, whether or not a financial member or supporter of the project

# Why host a project under an open source foundation?

1. You believe the project will gain wider community adoption if it's no longer solely affiliated with the corporate partner.
2. Several companies are working on very similar projects, and transferring management to an open source foundation would unite people under a common project.
3. There are legal or administrative tasks essential to the health of the project, and it's not clear which current participant should own these tasks. These types of needs typically only arise after a project has already become reasonably established, with an active contributor community and often one or more dedicated corporate partners.

# On-boarding Projects into LF AI

- › Projects are on-boarded and progress pursuant to the LF AI Foundation's Lifecycle and Project Contribution Process Documents.
  - › Three stages: Incubation, Graduation and Archive.
  - › These documents can be found on GitHub:  
<https://github.com/LFDLFoundation/proposing-projects>

# LF AI Project Maturities

## › Incubation

Projects join LF AI as incubation by meeting the requirements set forth in the “Project Process and Lifecycle Document”.

TAC Vote.

## › Graduation

Incubation requirements.

Additional requirements as set in the “Project Process Lifecycle Document”.

TAC Vote + GB Vote.

## › Emerituis

Emeritus projects are projects which the maintainers feel have reached or are nearing end-of-life. Emeritus projects have contributed to the ecosystem, but are not necessarily recommended for modern development as there may be more actively maintained choices.

# Criteria to Accept Incubation Project Under LF AI

- The project uses an OSI-approved open source license
- The project does not have dependencies on components that are either proprietary or licensed under a non OSI-approved license
- Submit a completed Project Contribution Proposal to the TAC via a Github pull request (<https://github.com/lfai/proposing-projects/tree/master/proposals>) along with a short and a short email notification to info@lfai.foundation
- Provide such additional information as the TAC or GB may reasonably request
- Demonstrate a substantial ongoing flow of commits and merged contributions
- Have a healthy number of committers. A committer is defined as someone with the commit bit; i.e., someone who can accept contributions to some or all of the project
- Be deemed by the TAC and GB to add value to the artificial intelligence, machine learning and/or deep learning space and to fall within the mission and scope of LF AI
- Agree to transfer any relevant trademarks to The Linux Foundation

# Criteria to Accept Graduation Project Under LF AI

In addition to the Incubation stage requirements, a project must meet these requirements:

1. Have a healthy number of committers from at least two organizations
2. Have achieved and maintained a Core Infrastructure Initiative Best Practices Badge
3. Demonstrate a substantial ongoing flow of commits and merged contributions
4. Document current project owners and current and emeritus committers in OWNERS.md and COMMITTERS.md files; copy of the project's charter (or other authorized governance document) shall be included or linked to in a GOVERNANCE.md or in a similar file
5. Receive the affirmative vote of two-thirds of the TAC and the affirmative vote of the GB

# Transitioning from Incubation to Graduation

- The TAC will undertake an annual review of all LF AI projects to assess whether each Incubation Stage project is making adequate progress towards the Graduation stage and whether each Graduation Stage project is maintaining progress to remain at Graduation level.
- The suggested time frame for the review is to start on September 1st and ends on October 31st and should end by Oct 31 with a set of recommendations for each project to improve and/or a recommendation to the GB on moving a project across stages.
- Projects can be provided with an extension of time in their stage (up to the discretion of the TAC).
- Any project may be moved to Emeritus stage by affirmative vote of the TAC, provided that the transition has secured:
  - An affirmative  $\frac{2}{3}$  vote of the TAC
  - An affirmative  $\frac{2}{3}$  vote of the GB



# Benefits - Apply to Incubation and Graduation Projects

- Larger community, larger pipeline of potential customers
- Validation from trusted source
- Scalable and neutral governance
- Neutral hosting of the project's trademark
- Marketing and awareness
- Collaboration opportunities with other LF AI projects
- Compliance scans
- IT enablement (specifics depend on project level)

# Specific Benefits for Incubation Projects

- The project has the right to refer to the project as an “LF AI Foundation Incubation Project”
- Appointment of an existing TAC member that will act as a sponsor of the project and provide recommendations regarding governance best practices
- Access to LF AI booth space at various events for demo purposes based on availability

# Specific Benefits for Graduation Projects

- The project has the right to refer to the project as an “LF AI Graduation Project”, which signals to the market that the project has reached a high level of technical maturity with confidence in its and readiness for deployment
- Projects designed as Graduation Projects by the GB get a voting seat on the TAC
- Graduation projects are eligible to request and receive support contingent on GB approval. The ability for a company to be represented on the GB and influence the internal GB process is highly beneficial to projects making such requests
- Priority access to LF AI booth space at various events for demo purposes
- Graduation projects have a technical lead appointed for representation of the project to the TAC

# Getting Involved

# Ways to Get Involved with LF AI Projects

☒ Participate in the development: Review and submit patches, report bugs, request features, test, etc.

☒ Contribute to project documentation

☒ Join the projects' mailing lists and participate in the discussions

☒ Attend developer events for LF AI projects

☒ Provide your testing and deployment feedback via appropriate project channel

☒ Start a local User Group Meetup

# Ways to Get Involved with the TAC

☑ Support TAC leadership in inviting speakers

☑ Share success stories, opportunities and challenges with the broader technical community

☑ Support technical leadership for harmonization efforts with other open source projects

☑ Support TAC in evaluating new projects for inclusion in LF AI; recommend new projects

☑ Participate in the ML Workflow effort

☑ Attend TAC Bi-weekly calls, participate in the discussion, volunteer

☑ Identify opportunities for collaboration on common interests and initiatives, seek input from peers

☑ Support TAC in hosting and sponsoring intra-project and inter-project developer events

☑ Support TAC Chair working with the GB to highlight opportunities and needed resource

☑ Participate in the effort to enable collaboration with other LF umbrella foundations and external communities

# Ways to Get Involved with LF AI Marketing & Outreach

☒ Promotion of project updates, releases, and news via LF AI social media accounts

☒ Attend Outreach Committee meetings and participate in ongoing activities

☒ Publish use cases, case studies, white papers, and deployment insights

☒ Marketing and PR support for demos at meetups and events

☒ Host vendor neutral content via LF AI blog site

☒ Get support for artwork, web site, content creation, etc., for LF AI projects

☒ Contribute to the LF AI landscape, promote in talks

☒ Coordination at events, speaking proposals, booth attendance, demos, etc.

☒ Volunteer to host an LF AI Day and Project developer events

☒ Identify speaking opportunities and help secure speakers from the LF AI community

☒ Help secure user stories about LF AI based deployments

☒ Support LF AI marketing and PR staff

# Joining LF AI Foundation is easy!

Please follow up with [Ibrahim Haddad](#)

Web site: <https://lfdl.io>

Email: [info@lfdl.io](mailto:info@lfdl.io)

Landscape: <http://l.lfdl.io>

GitHub: <https://github.com/lfai>

Wiki: <https://wiki.lfai.foundation>