LFAI Interop Committee Proposal

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Overview

With recent development of the Pyro project, an incubation project of LF AI Foundation, Julia and MindSpore, it has become evident that AI native programming is the next trend in deep learning framework development. Gone with the old days that mathematical libraries were added to existing engineering toolsets, data scientists will more and more likely to use their familiar toolset with more engineering capability added. AI developers should be able to write the models as the mathematical format without a steep learning curve of software engineering

Problems to solve

1 Northbound Interoperability when the AI Native programming framework is adopted for applications in different areas.

2 Southbound Interoperability when the AI Native programming framework is used on various compute and storage backends
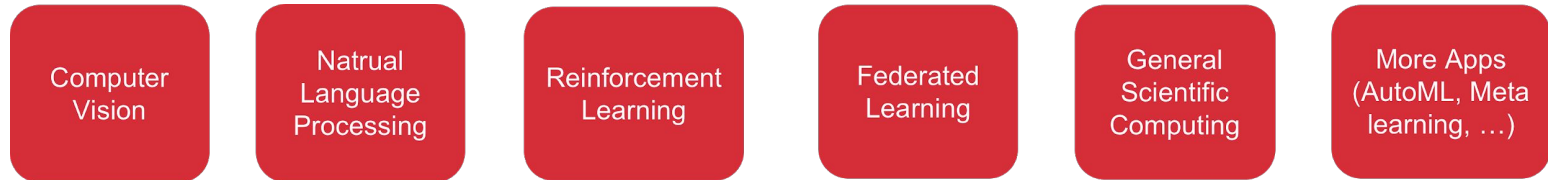
3 Framework Interoperability when traditional deep learning frameworks need to be supported or transformed. (**ONNX**)
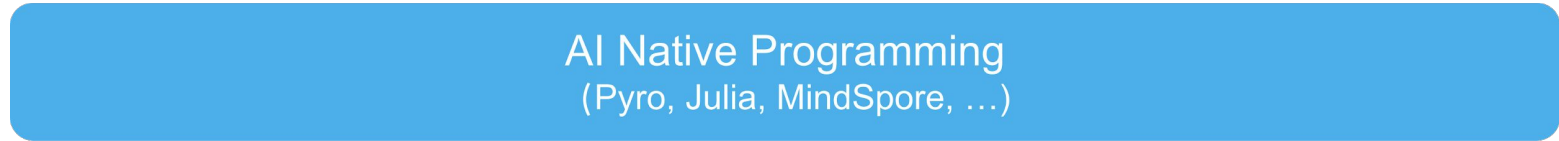
4 Build Interoperability when various types of deployment could be reproducible on different pipelines. (**Kubeflow**)

Interop Landscape

Computer Vision	Natrual Language Processing	Reinforcement Learning	Federated Learning	General Scientific Computing	More Apps (AutoML, Meta learning, …)

Northbound: Interop Among Frameworks (IR, Crypto, Type System,Metadata …)

AI Native Programming
(Pyro, Julia, MindSpore, …)
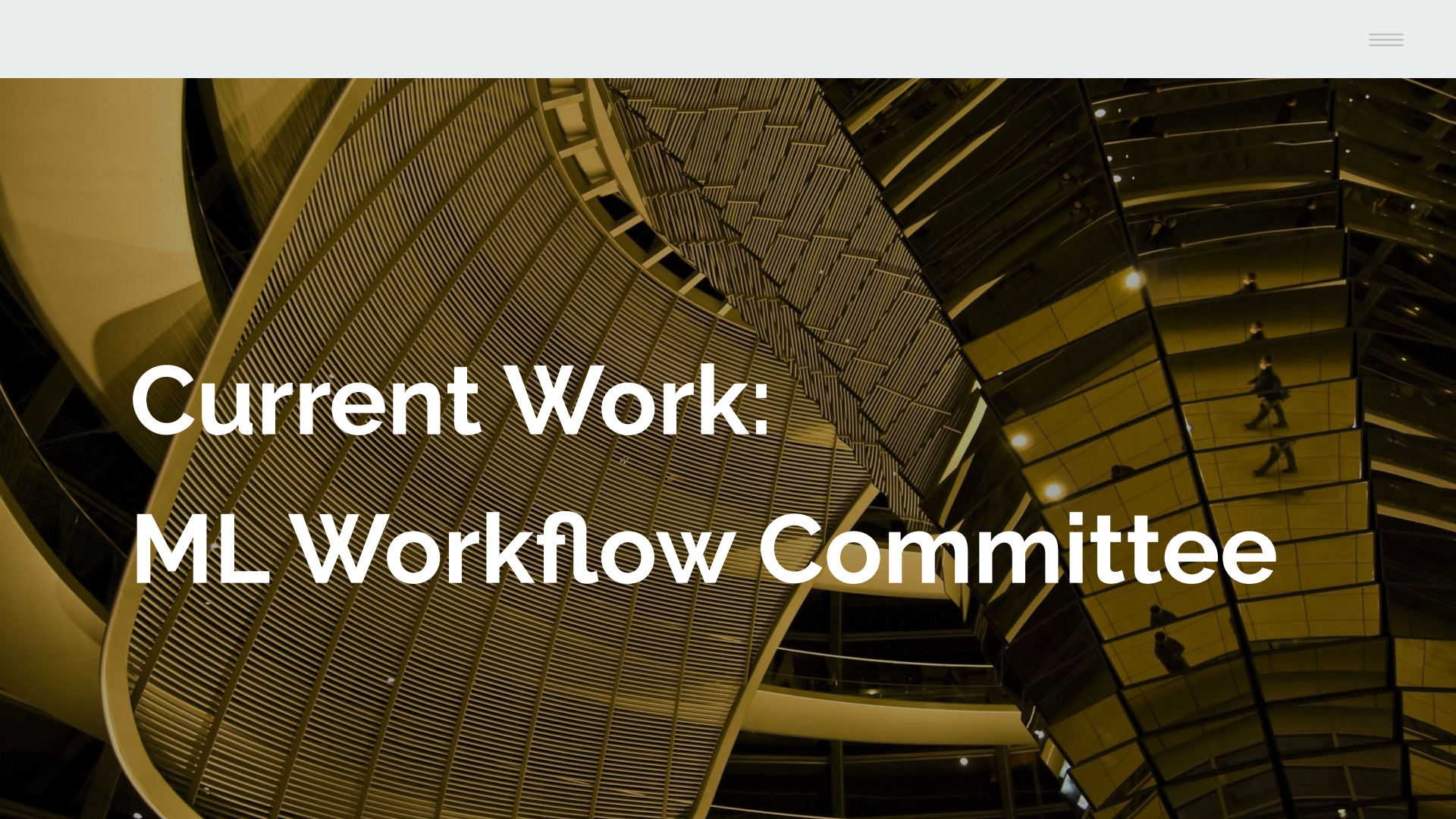
Southbound: Interop Between Frameworks and Backends

AI Domain Specific Hardware
(Ascend, GPUs, FPGAs, ASICs,…)

Storage
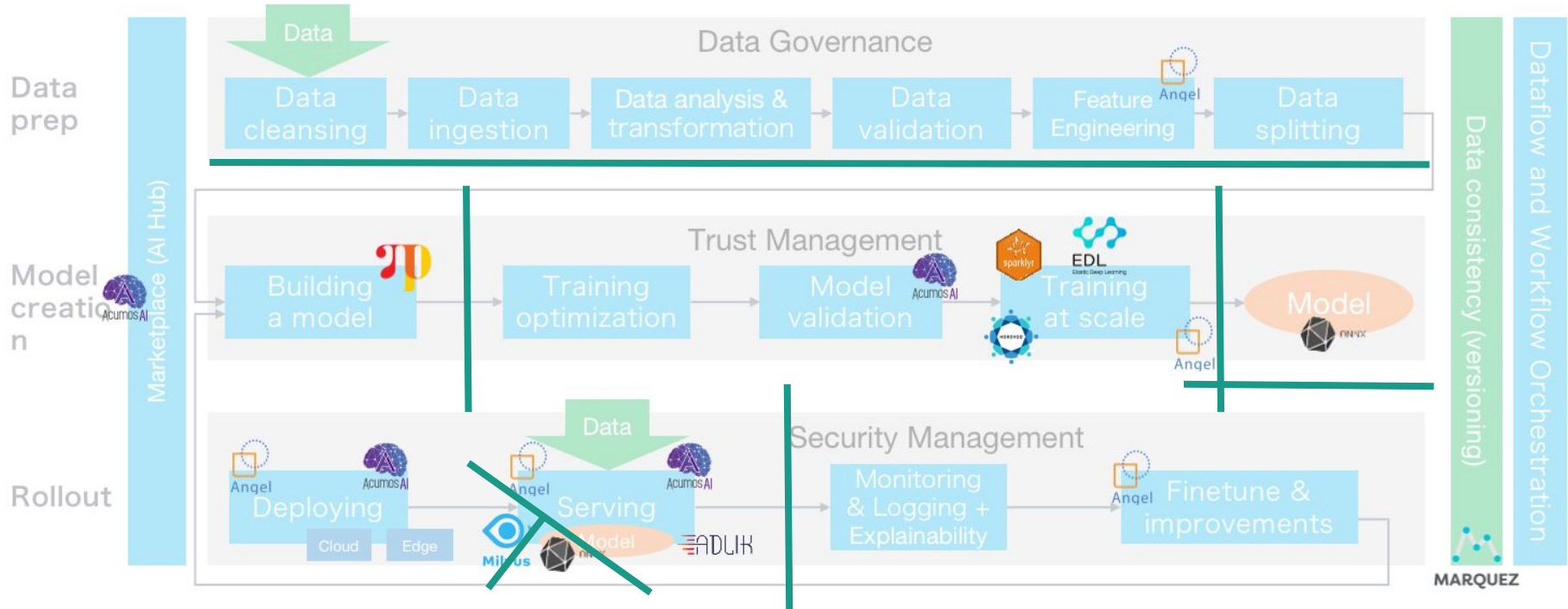(Raw Volumes, Object Storage, Database…)

Proposal

We propose LFAI to either create a new committee or adapt an existing one to address the interoperability issue.

Current Work:
ML Workflow Committee

ML Workflow Committee - LFAI Stack

Proposed Work: Interop Committee
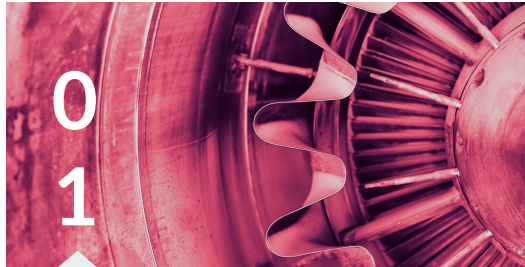
Interop Committee

Address the northbound and southbound interoperability problem and work with LFAI community at large to solve framework and build interoperability issue

01 | Identify the gaps
02 | cross community discussion
03 | upstream gap-fulfilling development
04 | interop specification
05 | joint proof of concept

Process (driven by cross community discussion)

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1

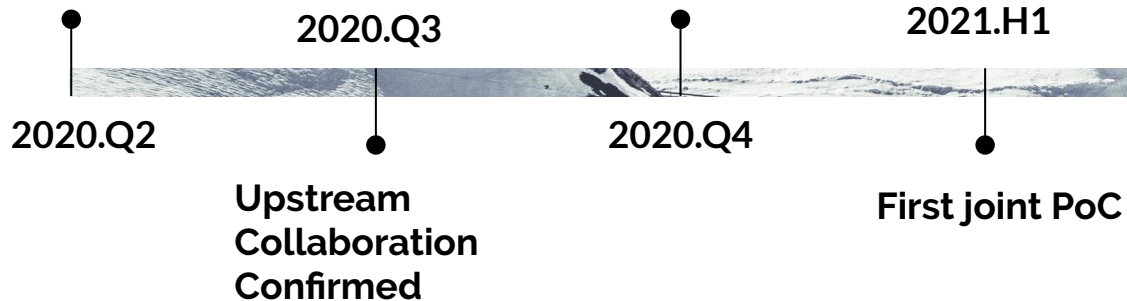Spec Drafting

Upstream Development

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2

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3

Joint PoCs

Timeline

First set of gaps identified

- Federated Learning
- Reinforcement Learning
- ...

First iteration of spec delivered

2020.Q3

2021.H1

2020.Q2

2020.Q4

Upstream Collaboration Confirmed

First joint PoC

Proposal For TOC

- Create Interop Committee, or
- Expand ML Workflow Committee's scope to address Interop issue (ML Workflow & Interop Committee ?)

Thank you.