ML Ops

AI models – beyond the limits of experiments

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LF AI & DATA

Agenda

Once upon a time… AI Experiments

- Moving from Data to AI driven
- Roles and architecture for AI development

Observations

- Datalake / Data store / Pre-processing / Features
- Performance
- User experience / Maturity

Solutions

- MLOps – roles and architecture

I need to collect, manage, secure **my data**

Let's build a **datalake…**

CIO
CTO

Yes, but… how do I **leverage** my data now?

CLOUDERA Hortonworks Spark nifi elastic SQL Server

Business Teams (Ops, Mkg, Dev…)

Data driven scenario

We need to address **use cases** (automate, predict, decide…)

Let's build **AI models…**

python jupyterhub data iku

AI driven scenario

Yes, but… how do I **access data and scale** my models now?

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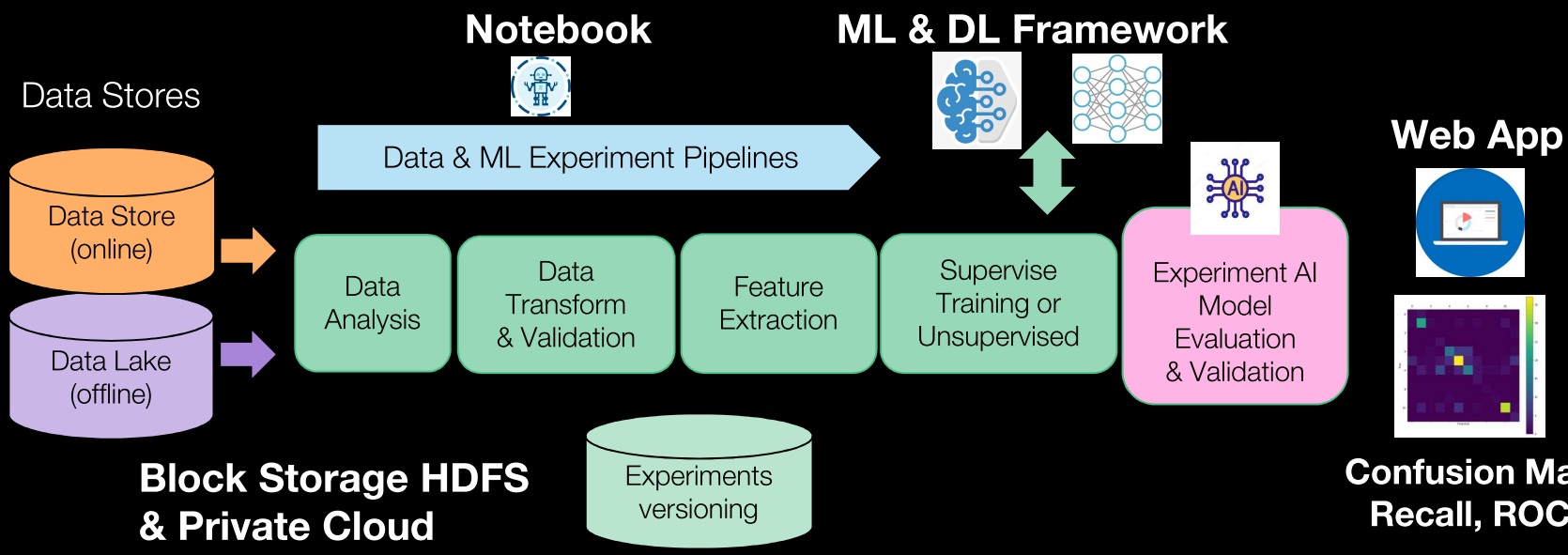
Data & AI Experiments Architecture

AI Roles: Data Eng, Data Analyst & Data Scientist



Then… what about model testing, monitoring, scaling?

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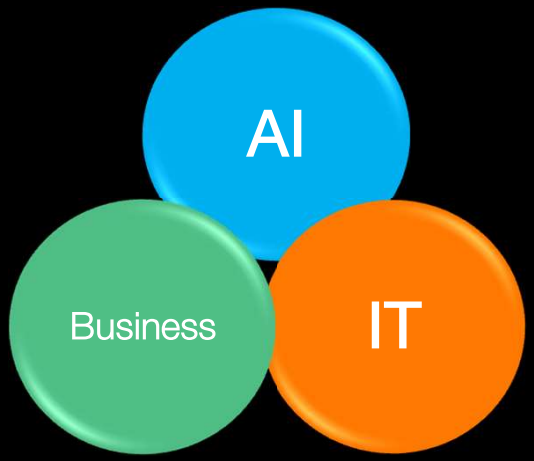
Data & AI Experiments - Experience & Observations

- ✓ AI Model developpers and Business Users don't speak the same language
- ✓ Data transform & validation often points out business challenges
- ✓ « Performance » is not understood the same



- ❑ Deliver AI Model asap Upgrade easily
- ❑ Understand user expectation & User Experience
- ❑ Address ML Lifecycle
- ❑ Assess your Maturity

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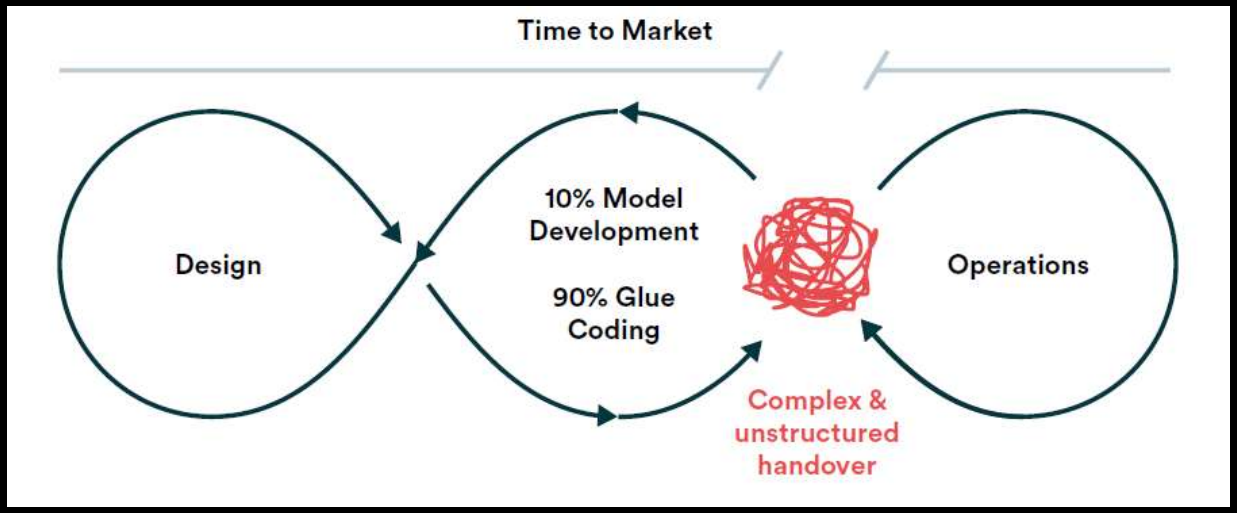
How to deploy ML models in Operations ?



Today only 20 % Companies can Deploy and to Operate ML models in operation & with Acceptable ROI

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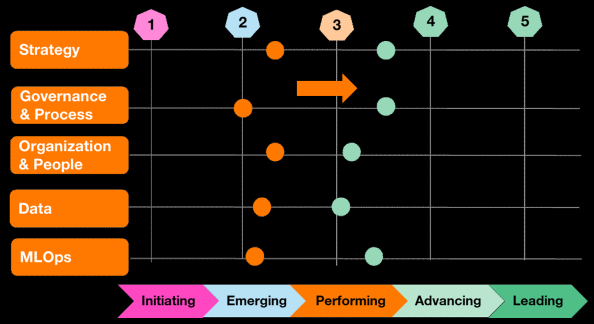
Five AI Maturity dimensions



Strategy

The plan of action for achieving the desired level of AI maturity in the organization.

Governance & Process

The policies, processes and relevant technology components required to ensure safe, reliable, accountable and trustworthy AI solutions.

Organization People

The leadership practices as well as roles, skills and performance measures required for people to successfully build and/or work with AI.

Data

The data required to support specific AI techniques defined by the AI strategy.

MLOps

The technical infrastructure and tools needed to train, deliver and manage AI models across their lifecycle.

Readiness for MLOps
At Maturity level from 3-4 / 5

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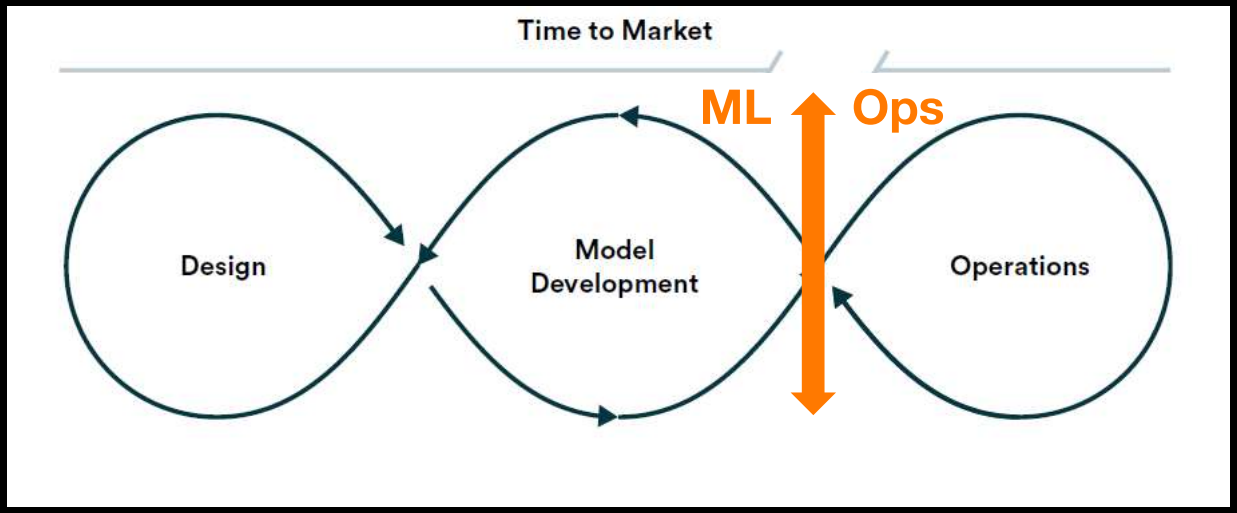
MLOps: Scale ML beyond the limits of experimentation



cover the entire ML lifecycle and all of the user roles necessary to create ML production systems

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ML OPs Architecture

AI Roles: Data Eng, Data Analyst & Data Scientist & ML Eng *

Data Stores

Data Store (online)

Data Lake (offline)

Producers (marketplace)

Data & ML Training Pipelines

AI Models Repo

Features & ML Serving Pipelines

API

API

*

Front End

Serving AI Model

*

Re-Training

Monitoring

*

Any (public) Cloud

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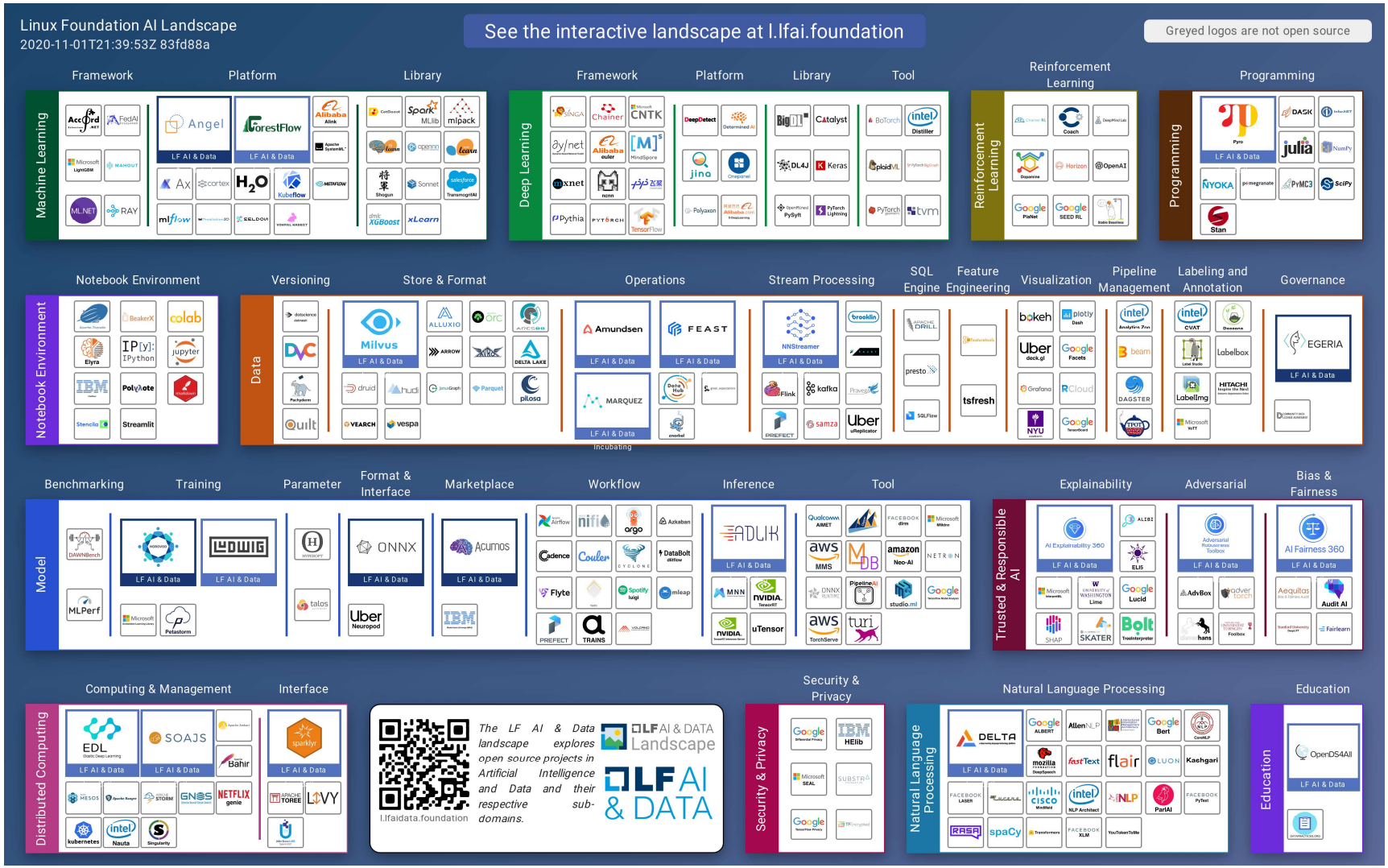
Linux Foundation AI Landscape
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Machine Learning
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Platform
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Platform
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Tool
Reinforcement Learning
Reinforcement Learning
Programming
Programming
Notebook Environment
Notebook Environment
Data
Versioning
Store & Format
Operations
Stream Processing
SQL Engine
Feature Engineering
Visualization
Pipeline Management
Labeling and Annotation
Governance
Incubating
Model
Benchmarking
Training
Parameter
Format & Interface
Marketplace
Workflow
Inference
Tool
Trusted & Responsible AI
Explainability
Adversarial
Bias & Fairness
Distributed Computing
Computing & Management
Interface
The LF AI & Data landscape explores open source projects in Artificial Intelligence and Data and their respective sub-domains.
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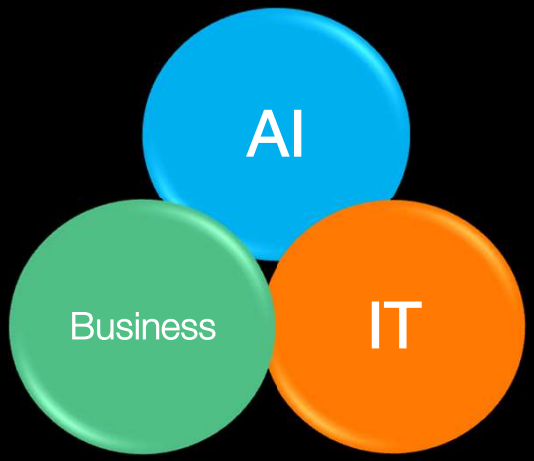
Security & Privacy
Security & Privacy
Natural Language Processing
Natural Language Processing
Education
Education

Key takeaways

- ✓ Developing AI pipelines as a first step to move towards an AI-driven Company
- ✓ Maturity of your Company shall be assessed to define and track a Transformation Plan, including roles and Governance



- ❑ MLOps platforms will bring the capability to manage the entire lifecycle of AI
- ❑ Testing, monitoring, scaling models are key from the very beginning
- ❑ ML Engineer as a key player to liaise between AI developpers and Business Owners

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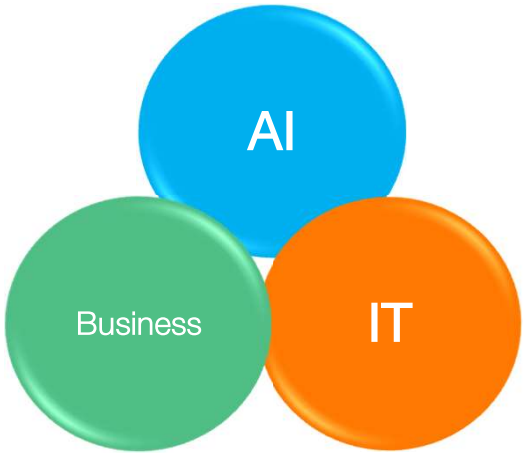
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