Lessons from the Field in Building Your MLOps Strategy

Harpreet Sahota, Data Scientist @ Comet

Agenda

What is MLOps?

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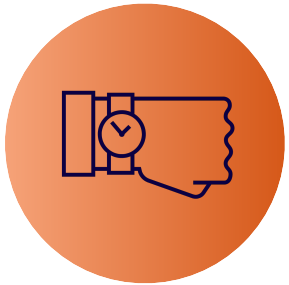
Agenda

What is MLOps?



The When

Agenda

What is MLOps?

The When

The How

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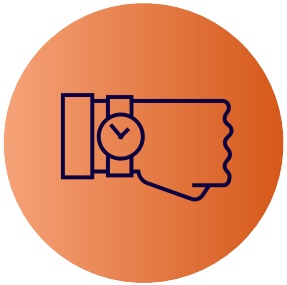
Agenda

What is MLOps?



The When

The How

Measuring Success

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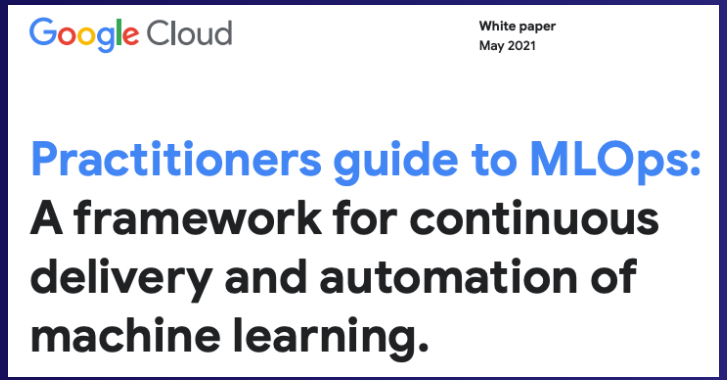
MLOps is popping up everywhere...



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What is MLOps?

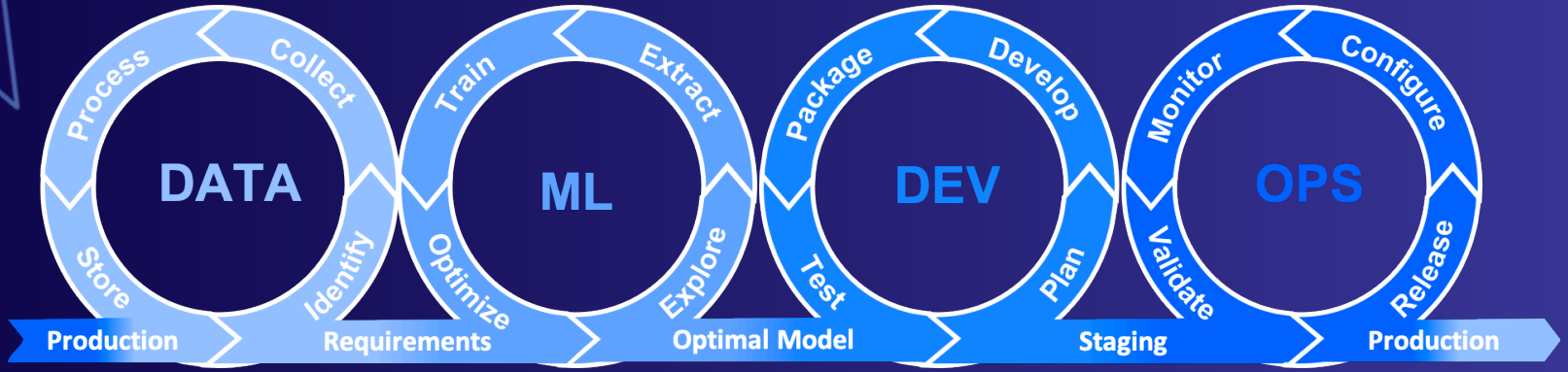

Image Source: Medium

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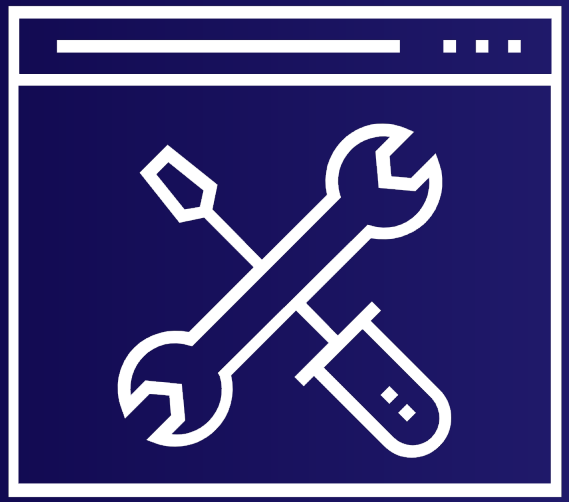
Successful MLOps Implementation

depends on…



Technical perspectives

Strategic perspectives

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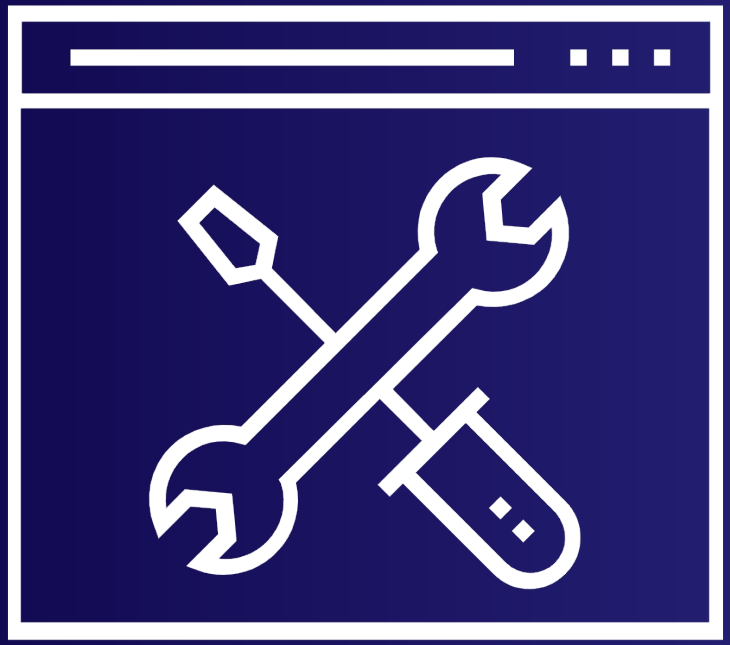
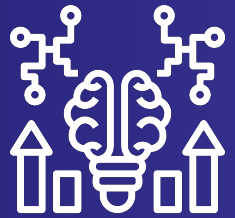
Not enough information is available on how to think about MLOps *strategically.*





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1 When to start implementing an MLOps Strategy

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“

MLOps is needed now, more than ever, as companies transition from using machine learning in an exploratory way to using it as a core operational software component to **deliver value**.

Christopher Brossman

Director of Data Engineering, The RealReal

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“

80% of AI projects will remain alchemy, run by wizards whose talents will not scale in the organization

Gartner, 2020

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The pain and frustration your teams experiences will grow

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What happens if I don’t adopt an MLOps strategy?

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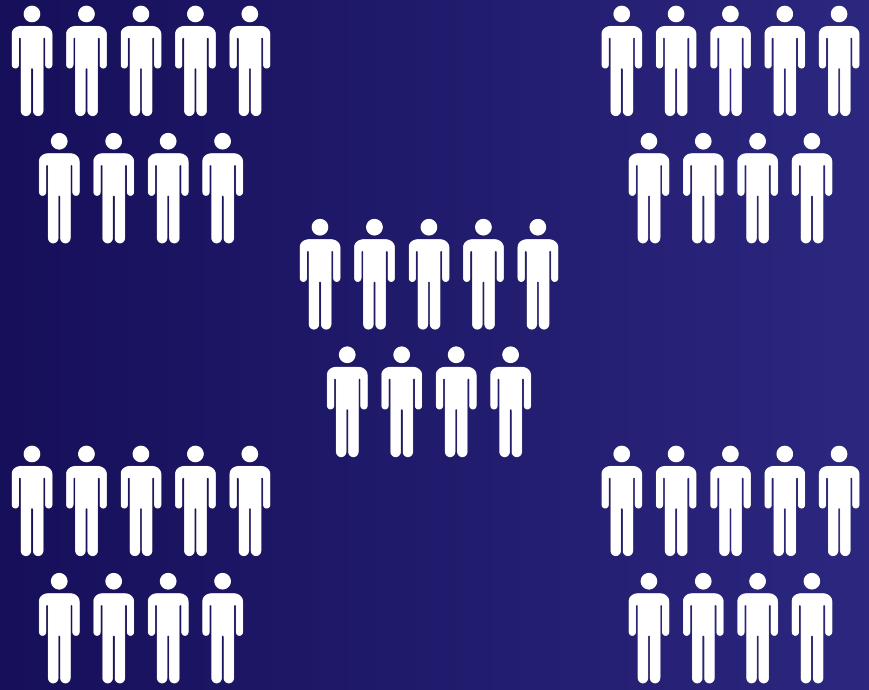

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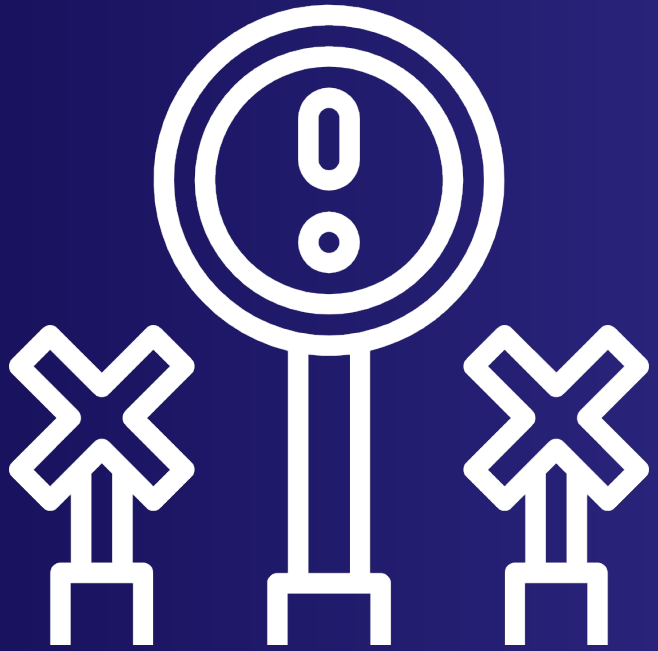

Your Life Without an MLOps Strategy

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Your Life Without an MLOps Strategy

Inefficient workflows and manual processes

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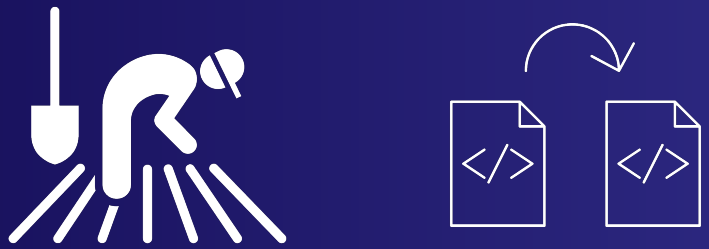
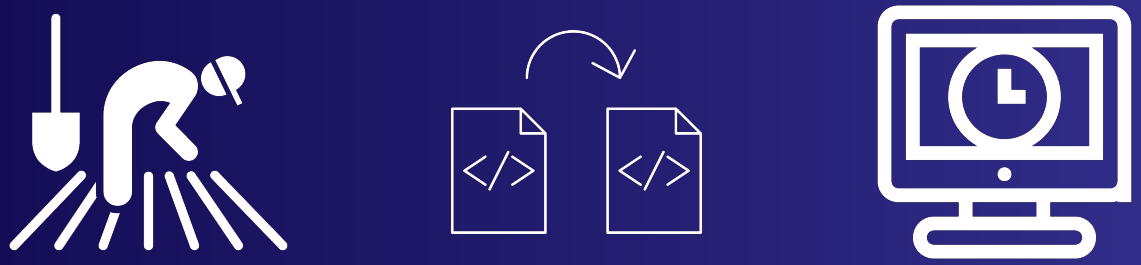
Your Life Without an MLOps Strategy



“Copypasta” code from place to place

Signs You Need an MLOps Strategy



Painfully long ramp-up times

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Your Life Without an MLOps Strategy

Deployment lags because everyone is busy

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More signs you need an MLOps Strategy…

Long retraining cycles

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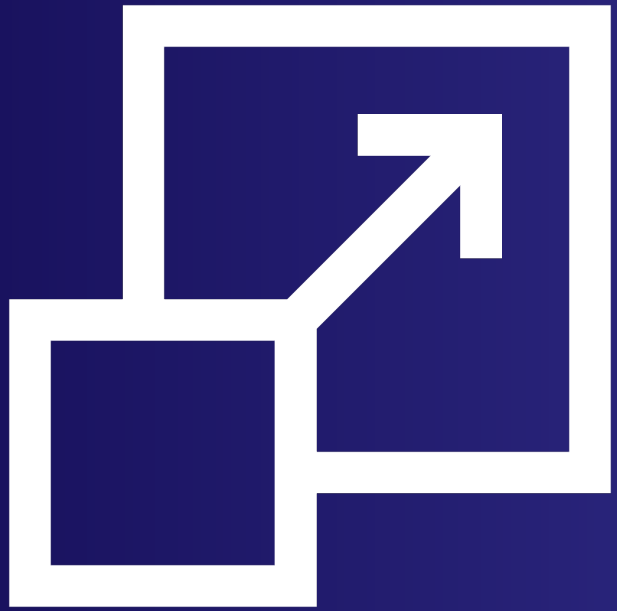
More signs you need an MLOps Strategy…



Scaling issues

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More signs you need an MLOps Strategy…

Technical Debt

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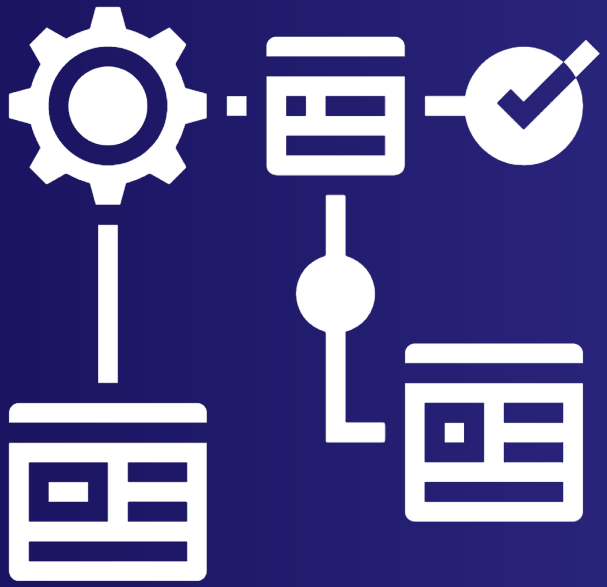
More signs you need an MLOps Strategy…



Lineage and traceability

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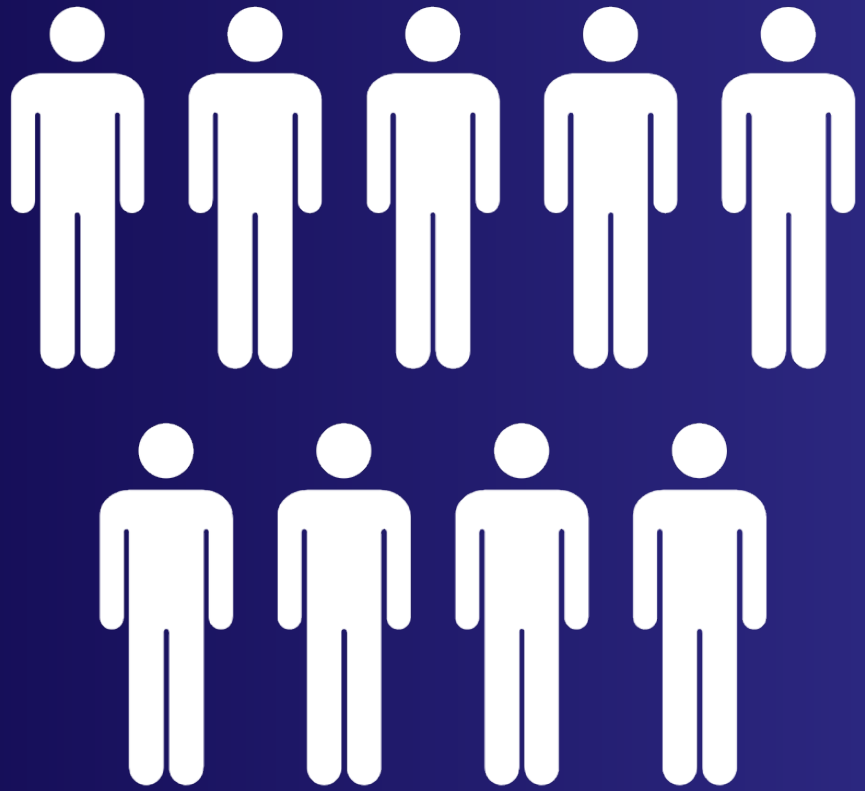

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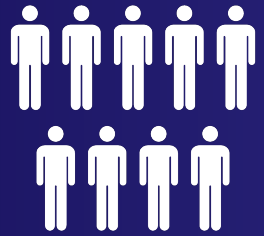

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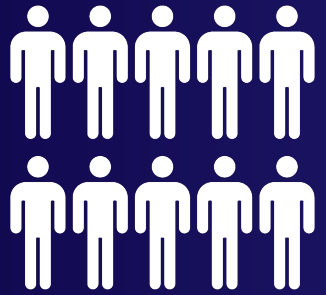
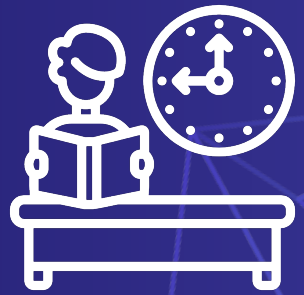
You should start implementing an MLOps strategy when…



Team size starts approaching 10+

You're noticing the warning signs



You don't "need" it yet

2 How to start implementing an MLOps Strategy

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Various shapes and sizes of machine learning teams

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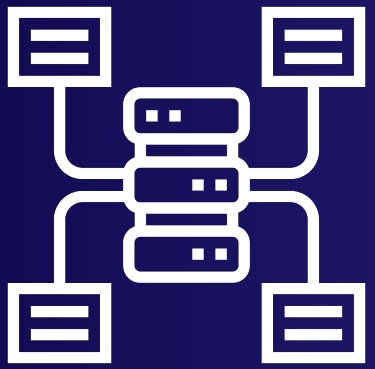
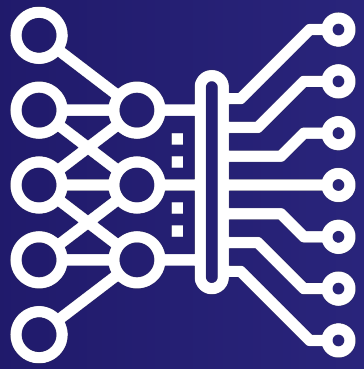
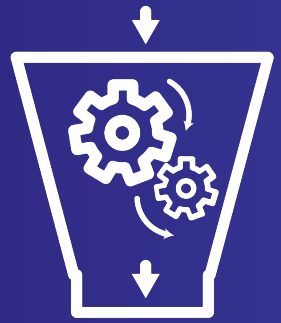
Teams do these activities differently



Data Sources



Modeling Strategies



Production

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Mission critical

Real-time

Batch jobs

Business decisions

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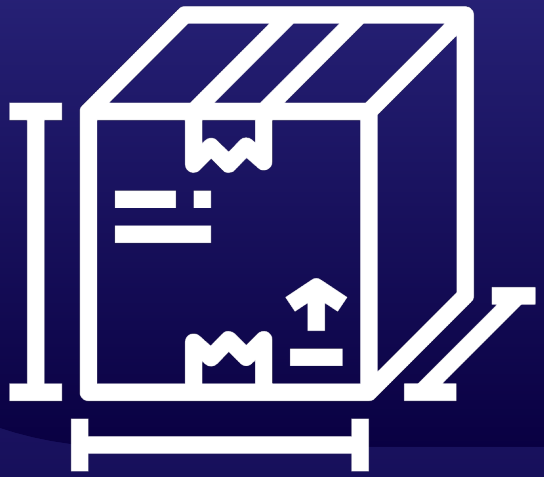
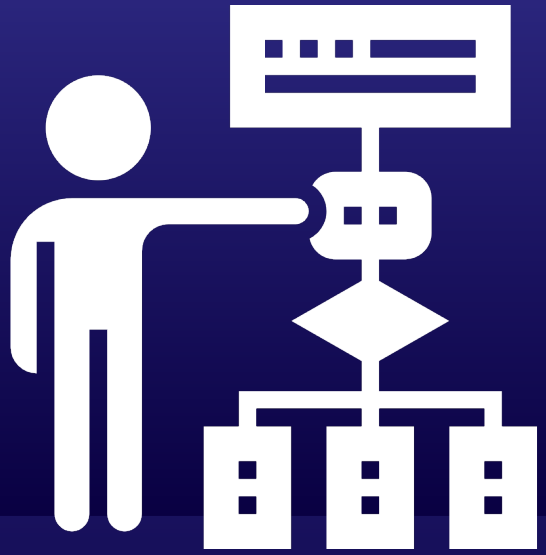


Team Size



Team Structure

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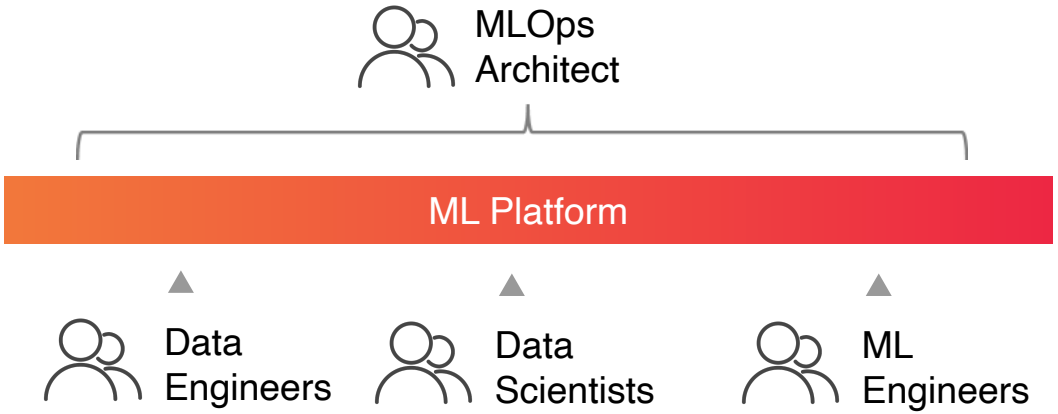
Team structure

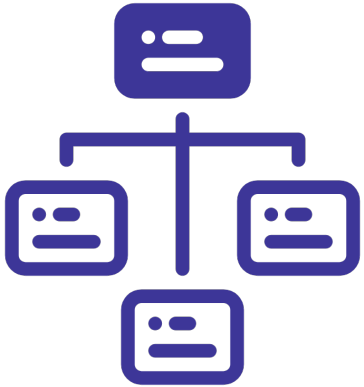
Hire an MLOps Architect once there are more than 10 people building models on your team.

Chris Brossman

The RealReal



Creating value for your business with ML depends on…



Structure

Communication

Collaboration

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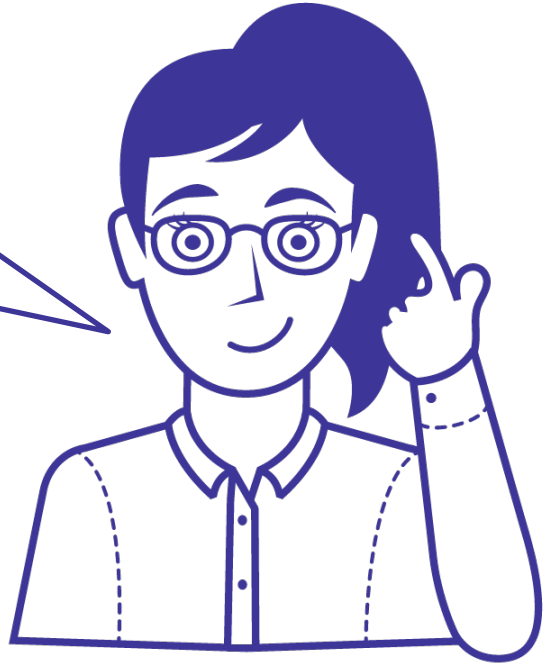
How can I create value out of machine learning for my business?



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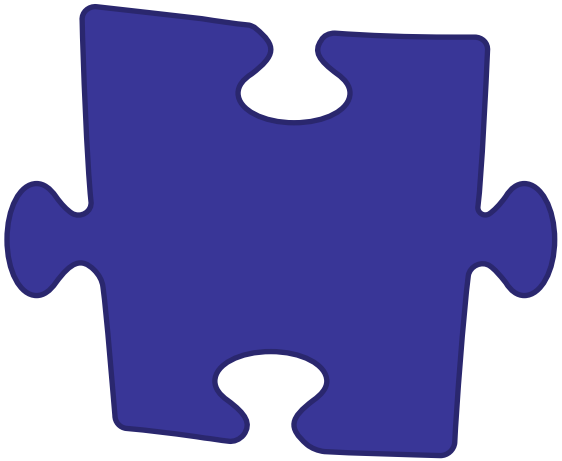
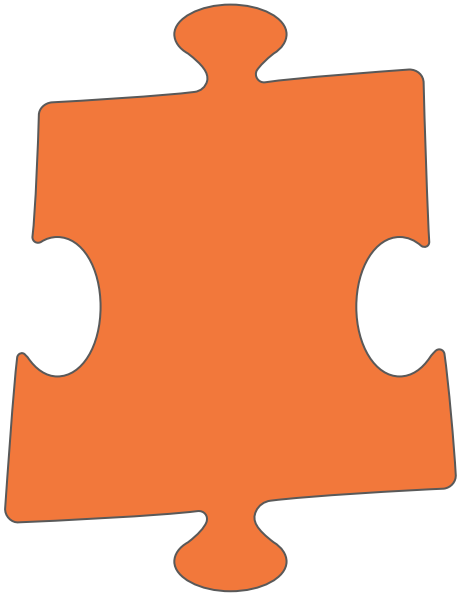


What machine learning can do



What's valuable for your business

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How can I create value out of machine learning for my business?

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Reporting

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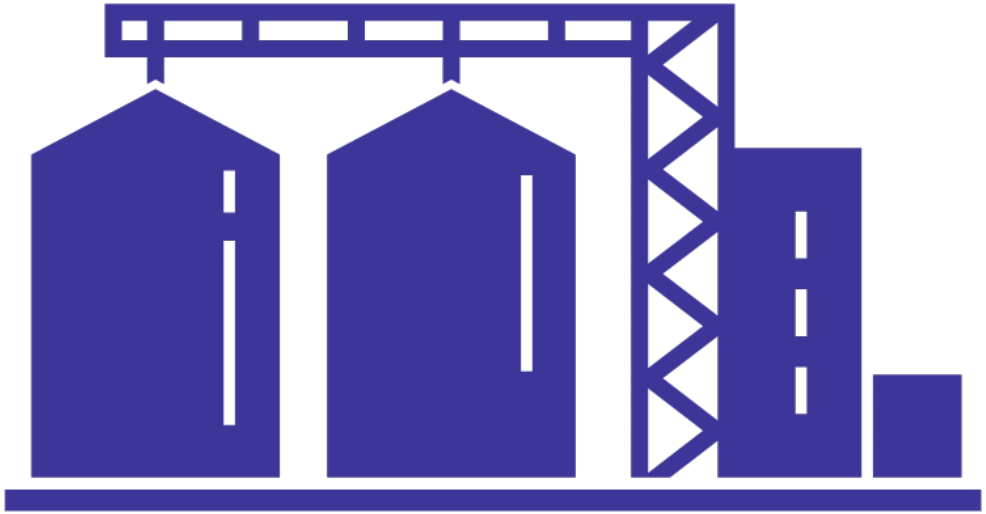

Data Scientists shouldn’t work in silos

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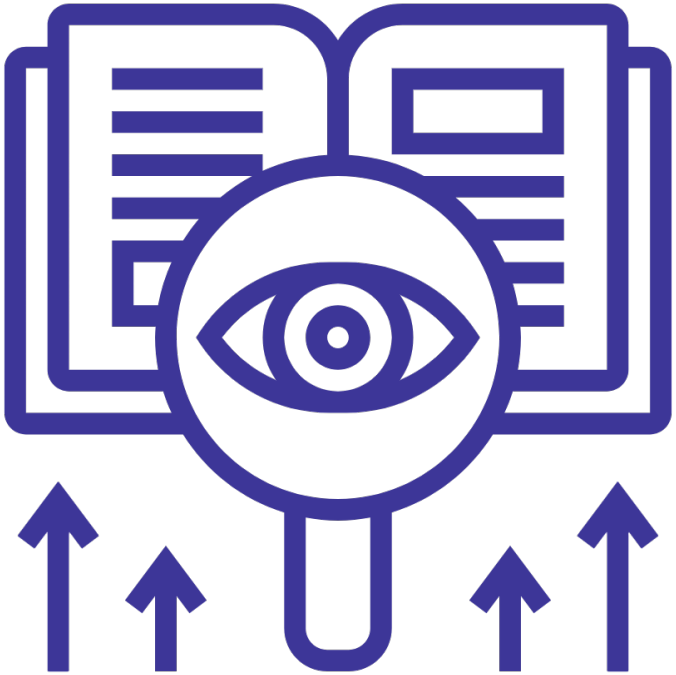

Reporting should be transparent and consistent

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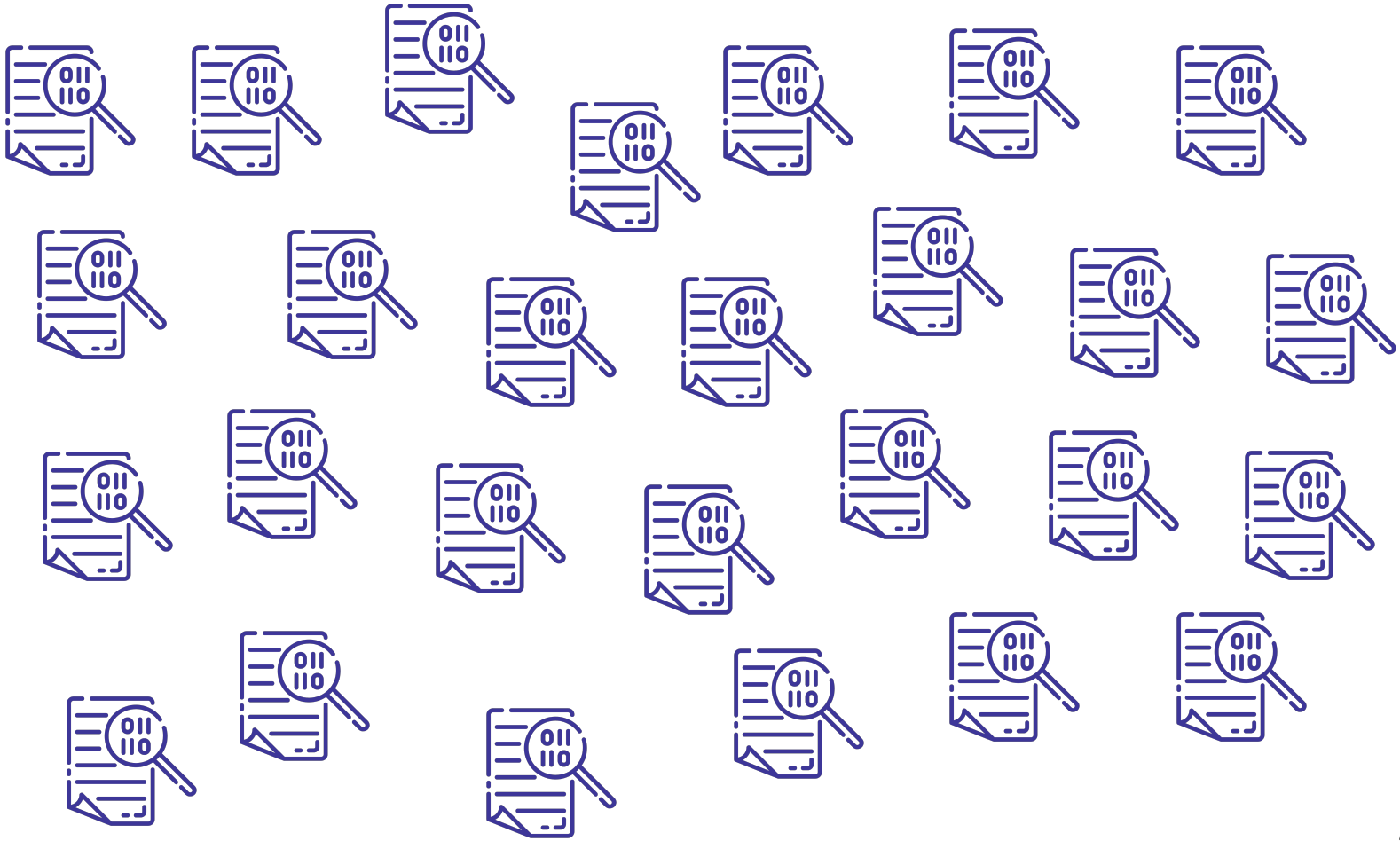

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Suraj Subraveti

ancestry

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Design a reporting structure so stakeholders can track progress and impact

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What about tooling?

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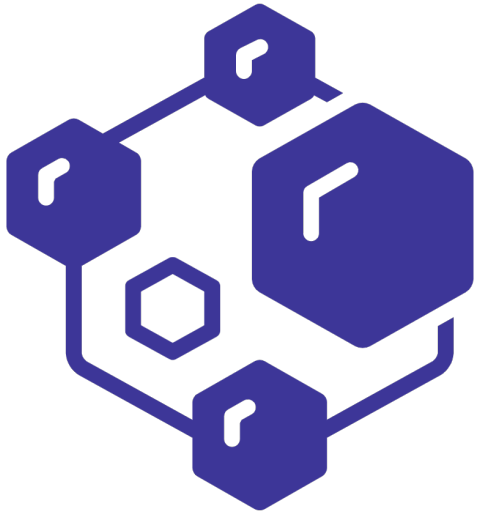

Modularity

Reusability

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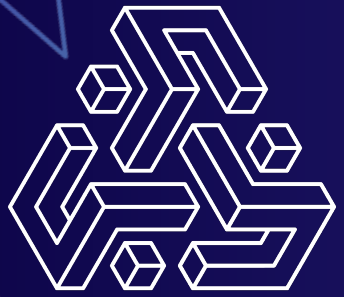
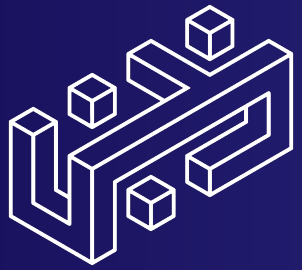
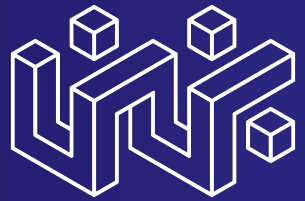
Welcome to the pipeline jungle



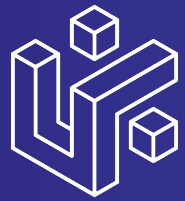
ETL



Training



Evaluation



Deployment

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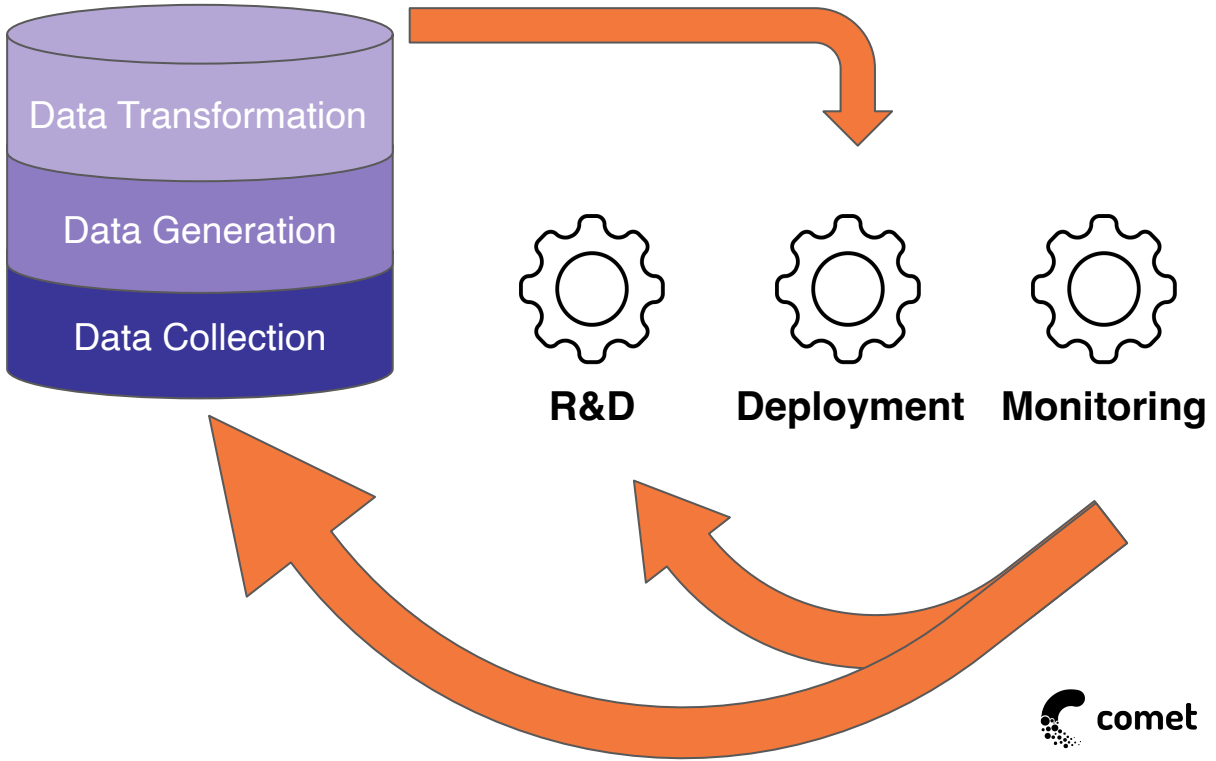
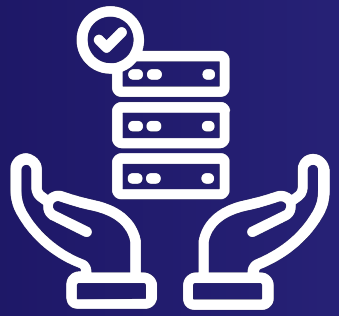
Tooling design

Chris Brossman
The RealReal



Even if your platform is…

Robust



Reliable

Remarkable

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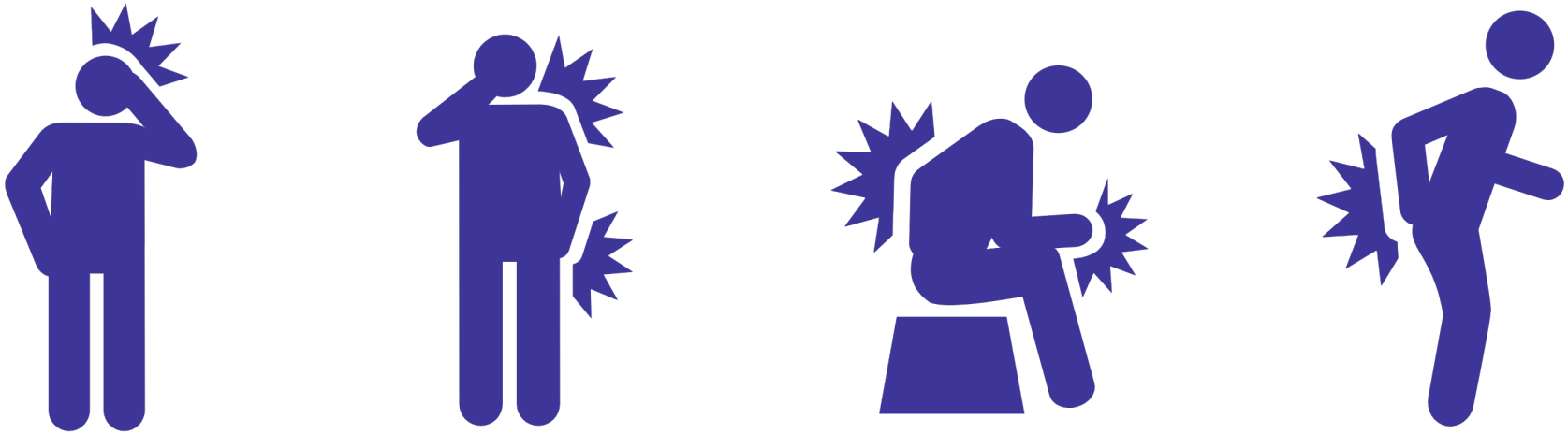
You will still feel growing pains



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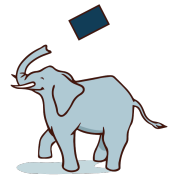

Pachyderm

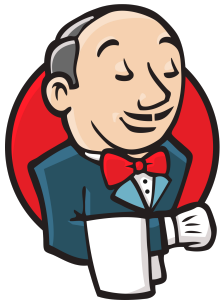
DVC

Weights & Biases

Apache
Airflow

K
Keras

neptune.ai



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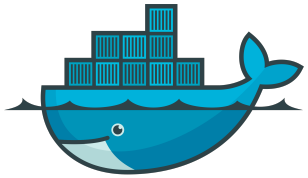
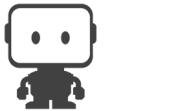
mlflow


docker

iguazio
SELDON


DataRobot

jupyter

TensorBoard

Amazon SageMaker

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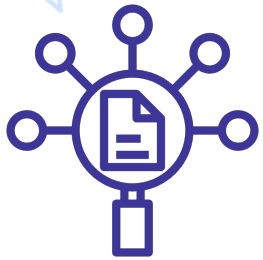
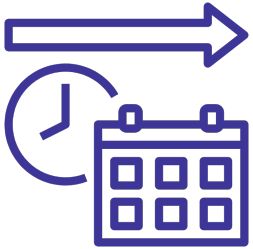
A framework for vendor selection: Look for tools that solve specific problems



Gather information

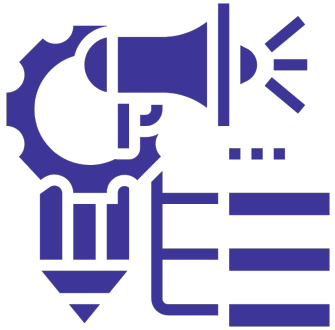
Identify manual processes



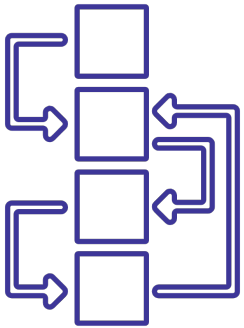
What takes too long?

Where can we improve?

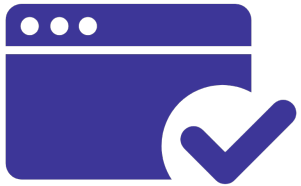
A framework for vendor selection: Data-driven evaluation



Specify features



Identify troublesome workflows



Test and verify with a pilot

A framework for vendor selection: Build a proof of concept

Be swift

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“

Beware of tool proliferation and **tight integration** with any one tool, because in just a few years **the landscape will drastically change** once again.

Christopher Brossman

Director of Data Engineering, The RealReal

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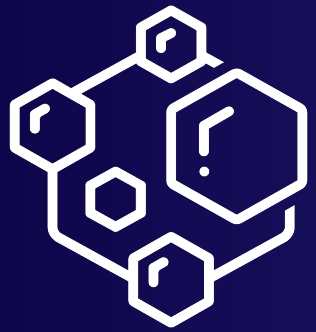
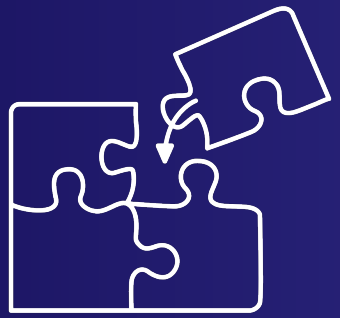
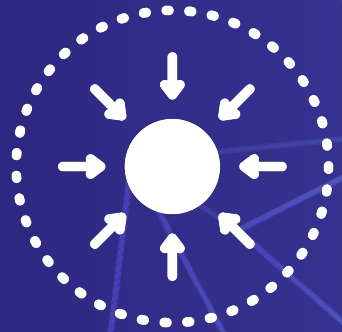
How to start implementing an MLOps strategy…



Keep things modular



Connect data scientists and stakeholders



Select tools that solve specific problems

3 How to measure the value of your MLOps Strategy

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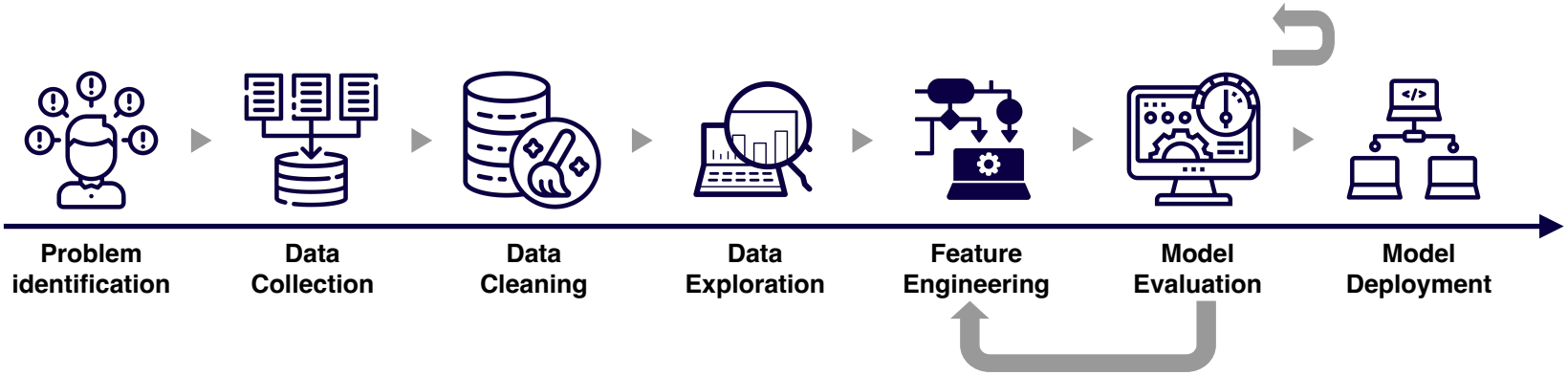
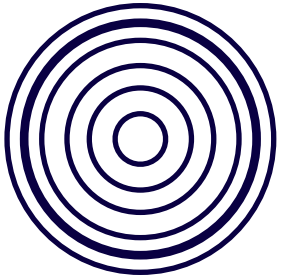
An experimental model development process



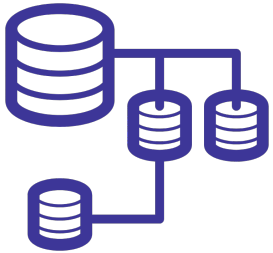
This is an iterative process, experimentation is expected.

It’s hard to measure a moving target



How Uber measures value during model development

Assess marginal impact on…



Time to **model-ready** dataset

Time to **prod-ready** model

Volume of experiments

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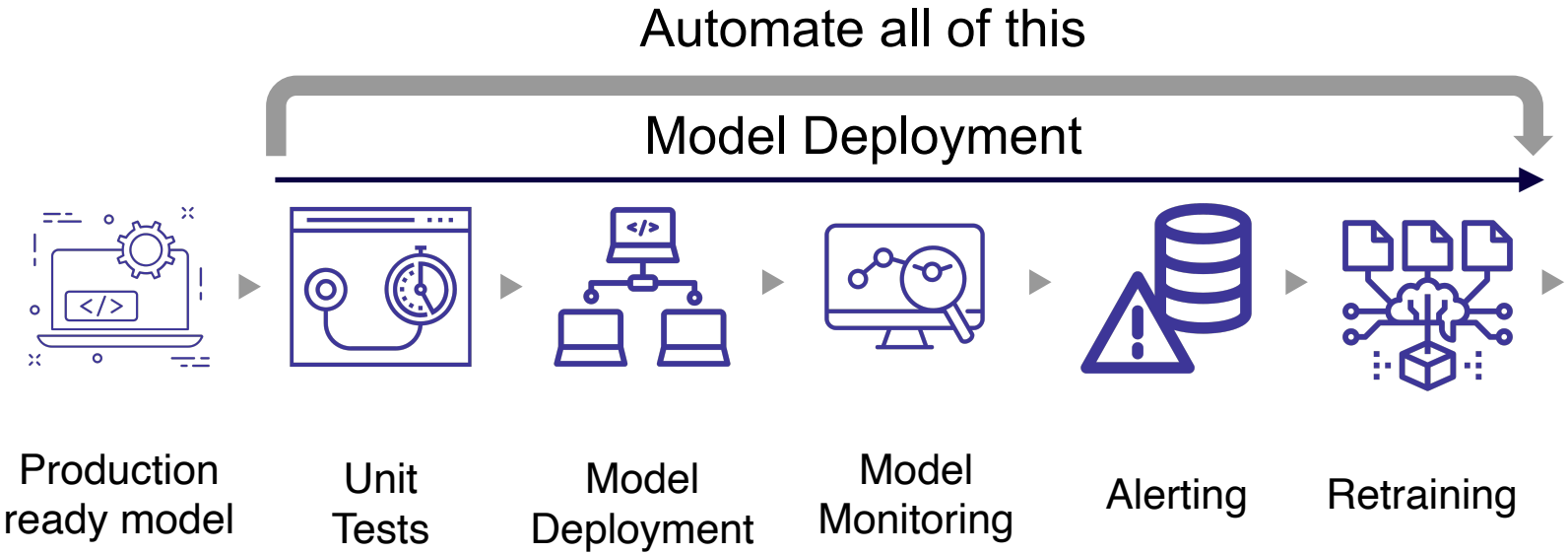
An automated model deployment process



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How Uber measures value during model deployment

Engineering hours saved on manual tasks

Recap

Adopting an MLOps strategy is a crucial and challenging set of decisions

Recap

Don’t ignore the warning signs

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Recap

Don’t ignore the warning signs

Communication is critical

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Recap

Don’t ignore the warning signs

Communication is critical

Aim for reusability

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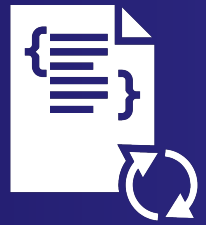
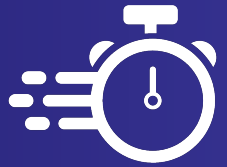
Recap

Don’t ignore the warning signs

Communication is critical



Aim for reusability



Optimize for speed and scale

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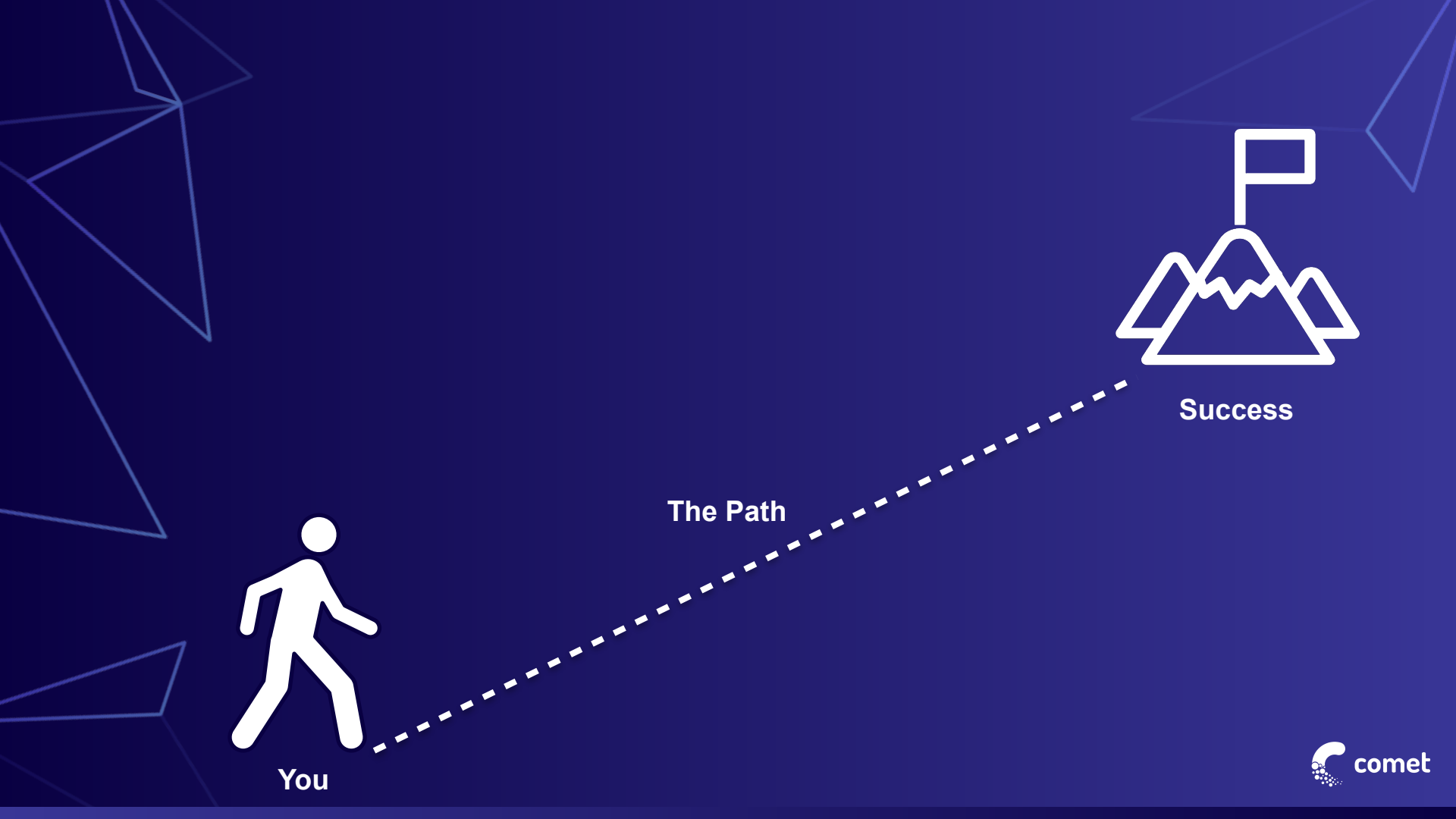

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A final note

Processes and best practices will become standardized

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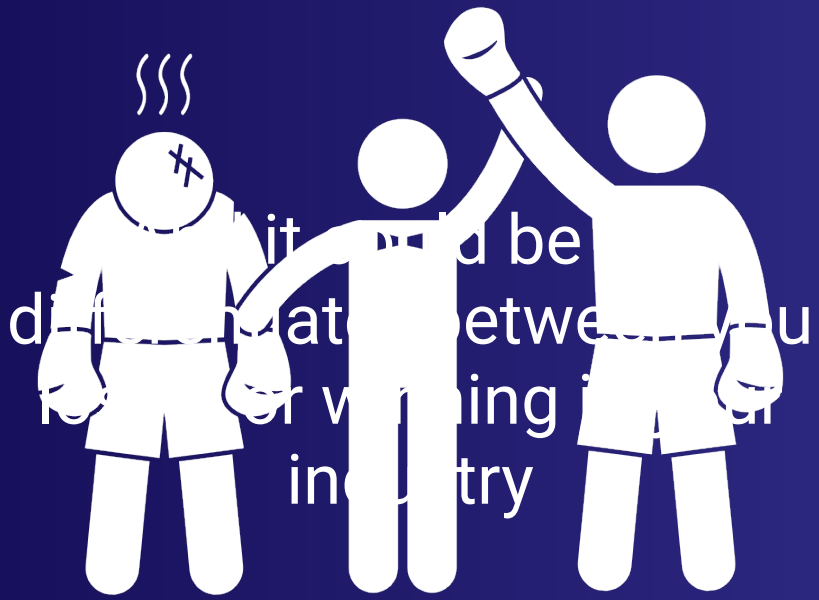
A final note



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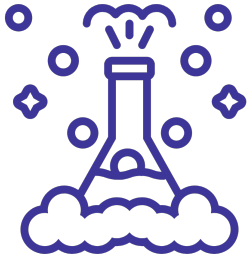
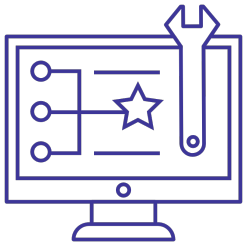
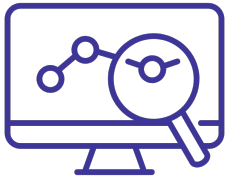


Experiment Management



Model Management



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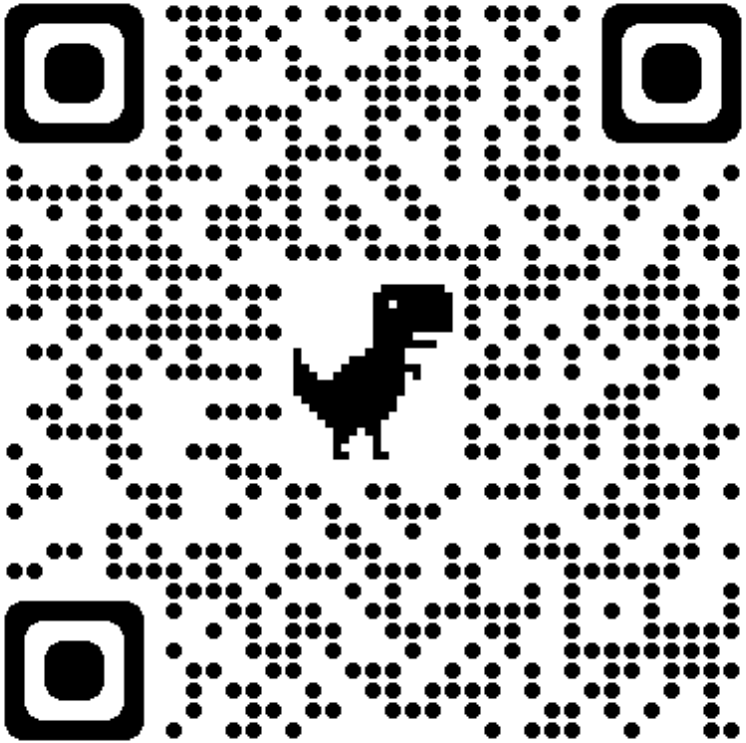

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Questions?

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Thank you!

Harpreet Sahota

Data Scientist @ Comet

Let's connect on LinkedIn!

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