A Whirlwind Tour of Machine Learning Engineering

Taking Models To Production

Andy McMahon
Data Scotland's Scottish Summer 2021

Science != Engineering
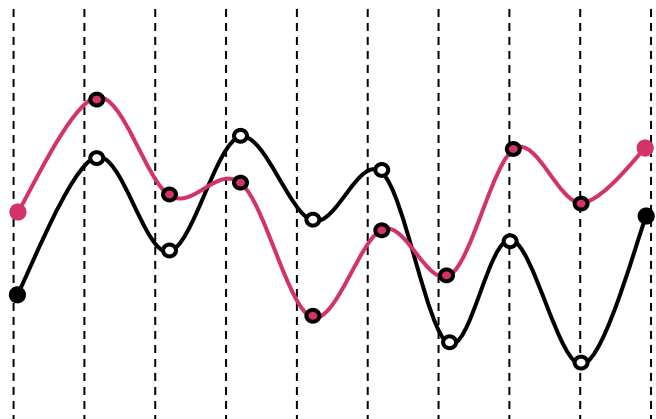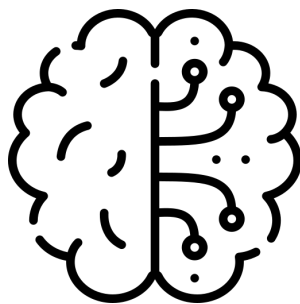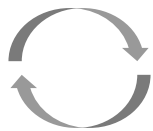
Machine Learning != Traditional Programming
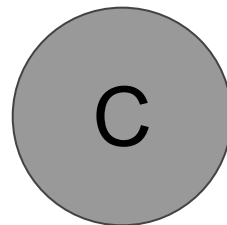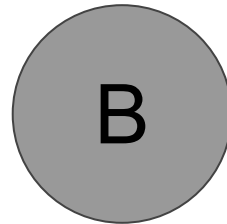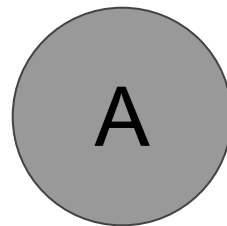
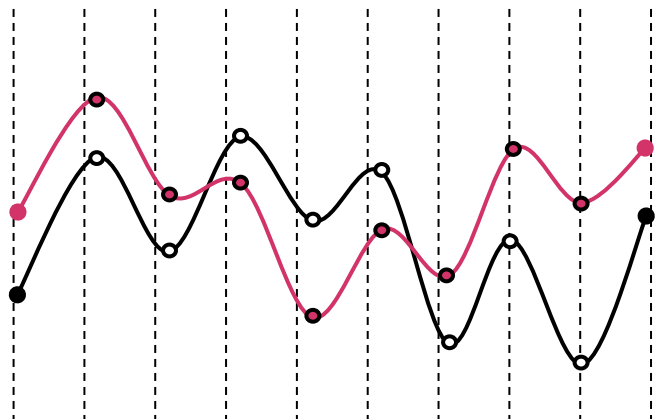# Production != Easy

Why do we do machine learning?

Decisions, decisions ...

DATA

MODEL

A

B

C

Decisions, decisions ...

DATA

MODEL

A

B

C
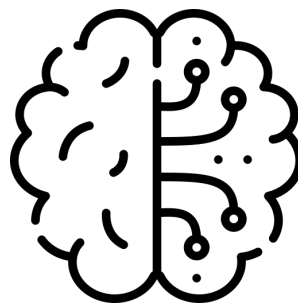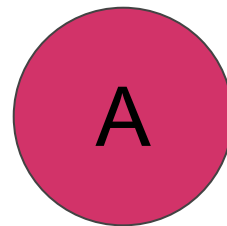
What do we need to know for deployment ...?

The 4 P's
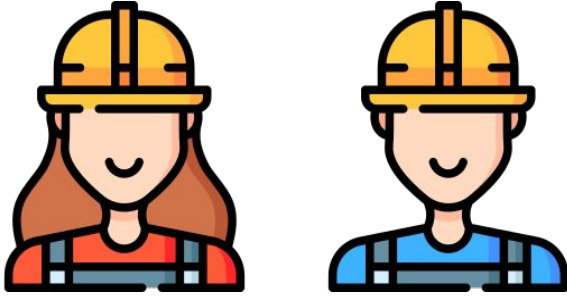
People
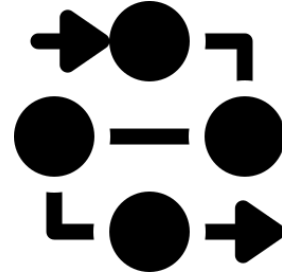
Process

Product

Pattern

People

Blended Teams > Unicorns
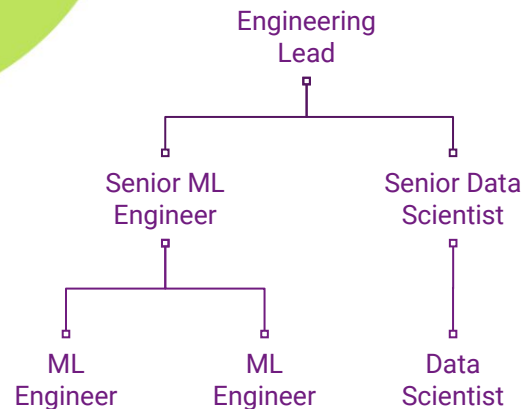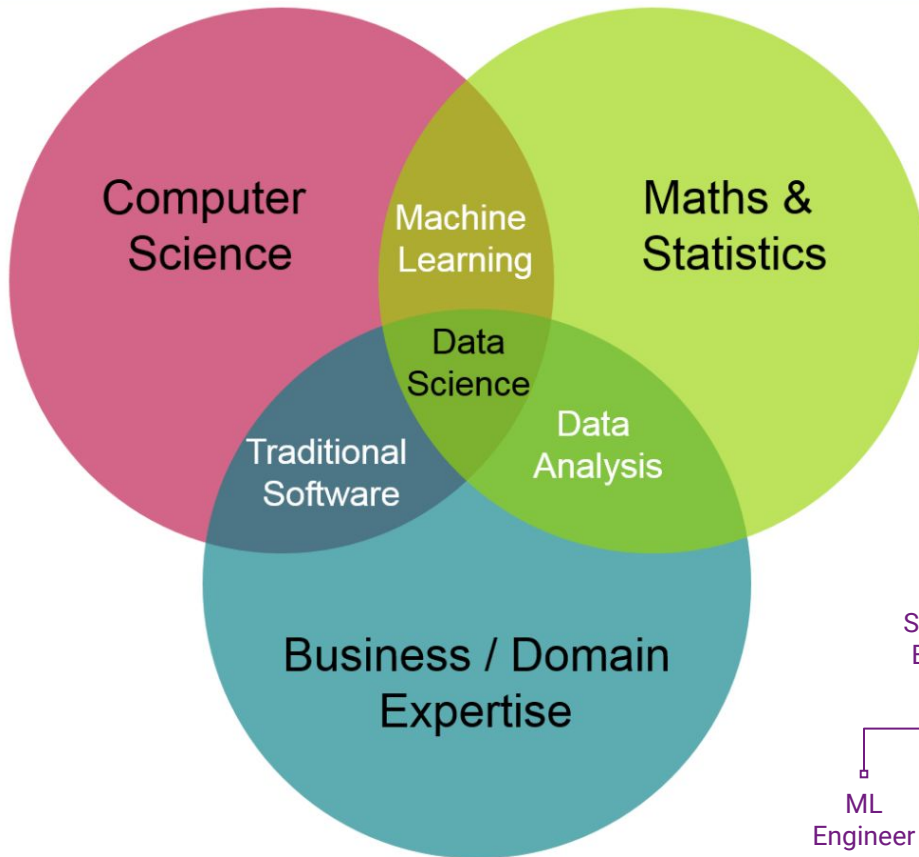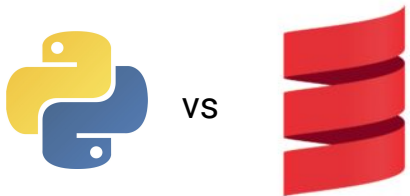
Product

Products != Models != Analyses
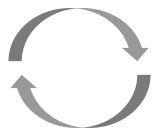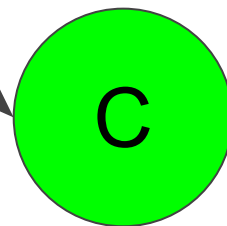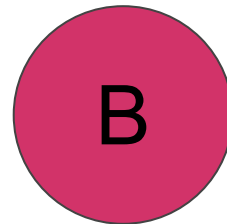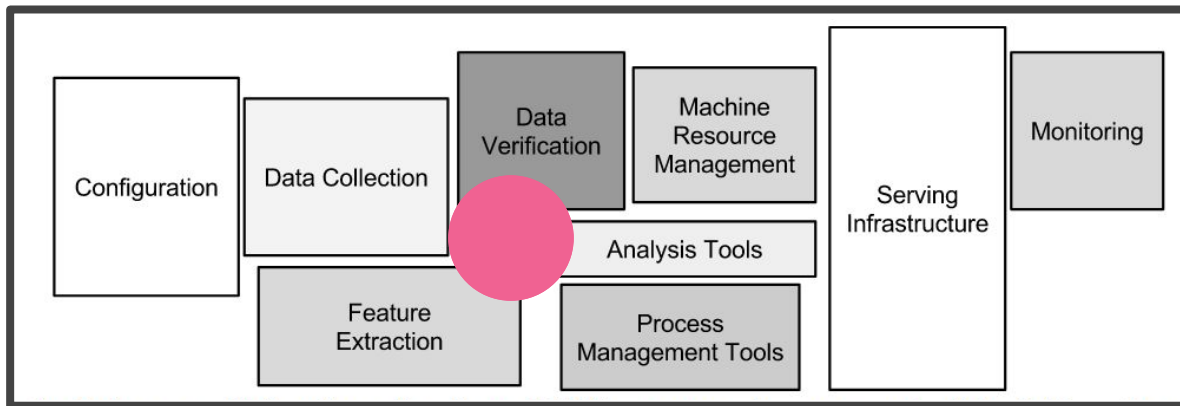

ML Engineering

Hidden Technical Debt in Machine Learning Systems, Google

Products work: Test, test, test …

Products get delivered: Don't reinvent the wheel …

Products come in a variety of shapes: Build for flexibility …

Patterns

Reuse, Repeat, Recycle
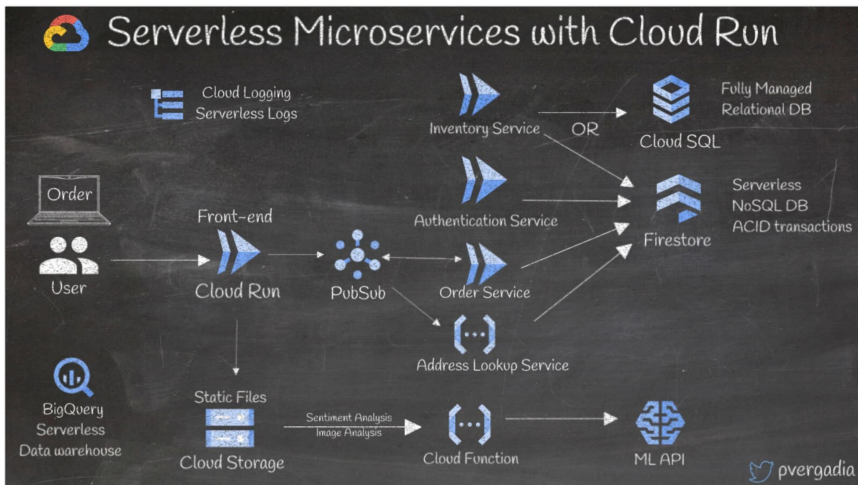
[13 sample architectures to kickstart your Google Cloud journey](#)
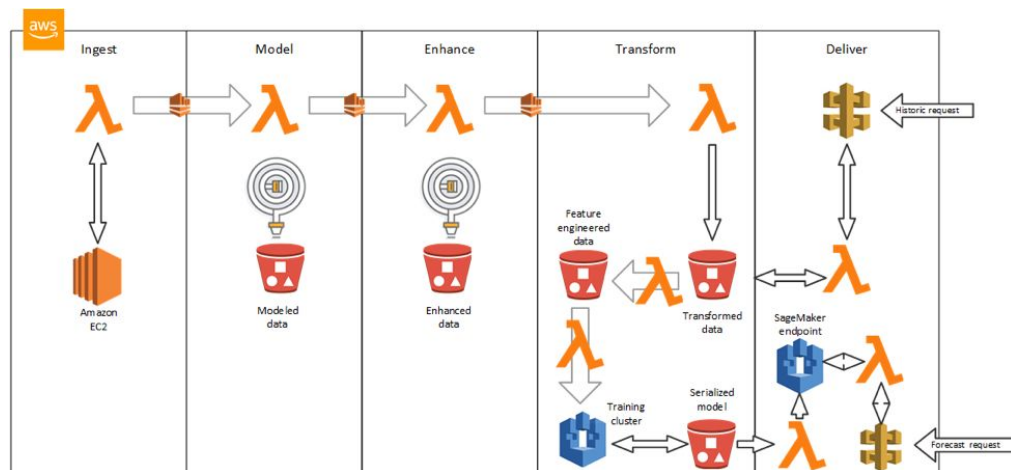
[Machine Learning Lens](#)
[AWS Well - Architected Framework](#)

Process

ML Dev Process

| Discovery | PoC | Development | Deployment |

- Work with subject matter experts and stakeholders

- Understand challenge

- Define end goal (KPIs, baseline performance)

- Sketch MVP implementation

- Summarise for sign off
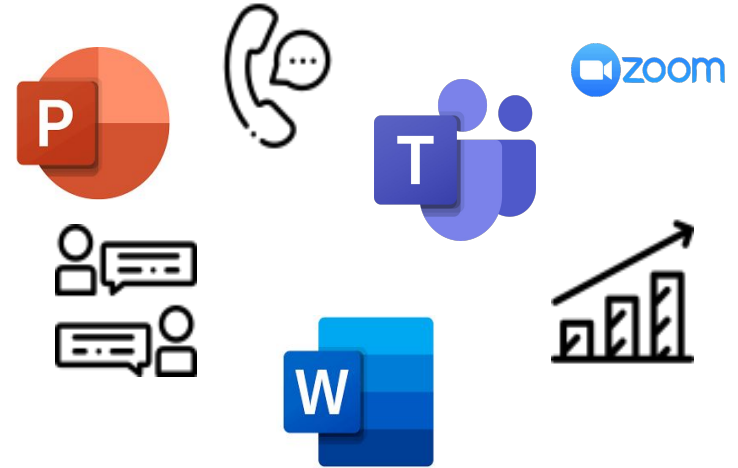
ML Dev Process

Discovery	PoC	Development	Deployment

- Exploratory data analysis

- Identification of 'no go' scenarios (blockers for the project)

- Identification of other project risks

- Bare bones implementation

- Evidence that the solution is viable and will solve the problem (sign off again)

ML Dev Process

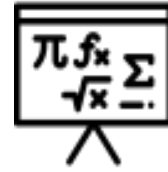Discovery | PoC | **Development** | Deployment

- Dev sprints

- Git strategy

- Unit and Integration tests

- Model version control

- Baseline performance tests/results

ML Dev Process

Discovery	PoC	Development	Deployment

- Final packaging

- Deployment and update strategy

- Infrastructure instantiation

- Documentation completion

- Performance monitoring

- CI/CD pipeline definition

In a Nutshell

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Slides will be available on GitHub