Machine learned search: setting up a production pipeline

Zalando SE

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Senior Research Engineer

20-01-2020

Picture from Pexels.com

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Programming vs. Software Engineering

Who is a Software Engineer?

Who does programming in their day-to-day work?

Who has a machine learning background?

DAMEN | HERREN | KINDER

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DE | EN Anmelden Wunschzettel Warenkorb

Get the Look NEU Bekleidung Schuhe Sport Accessoires Beauty Premium Marken Sale %

boho kleid

Bekleidung
Schuhe
Sport
Accessoires
Premium
Beauty
Sale
Geschenkgutscheine

'boho kleid'

Sortieren | Größe | Marke | Farbe | Preis | Obermaterial | Muster | **Mehr Filter**

33 Artikel

Gesponsert

WEEKEND MaxMara 374,95 €
TORNADO - Strickkleid - anthrazit

YAS 49,99 €
Freizeitkleid - sudan brown

Nly by Nelly ~~54,95 €~~
BOHO TUNIC DRESS - Freizeitkleid... **49,49 €**

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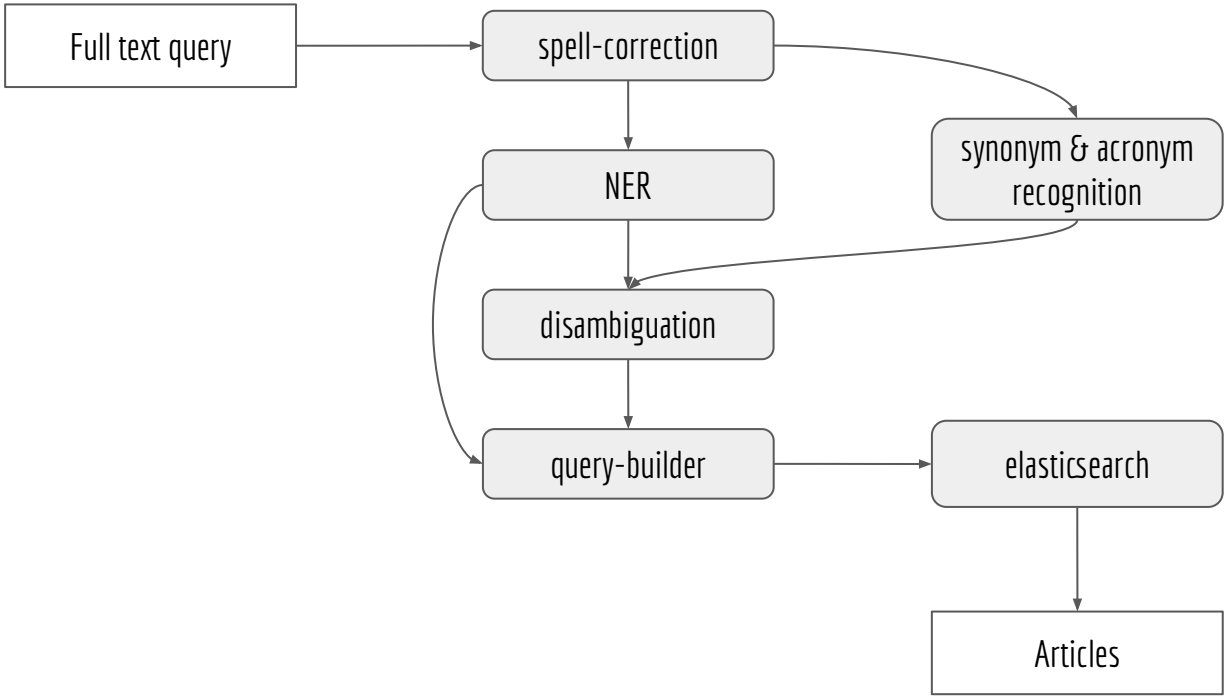
Our Information Retrieval Pipeline



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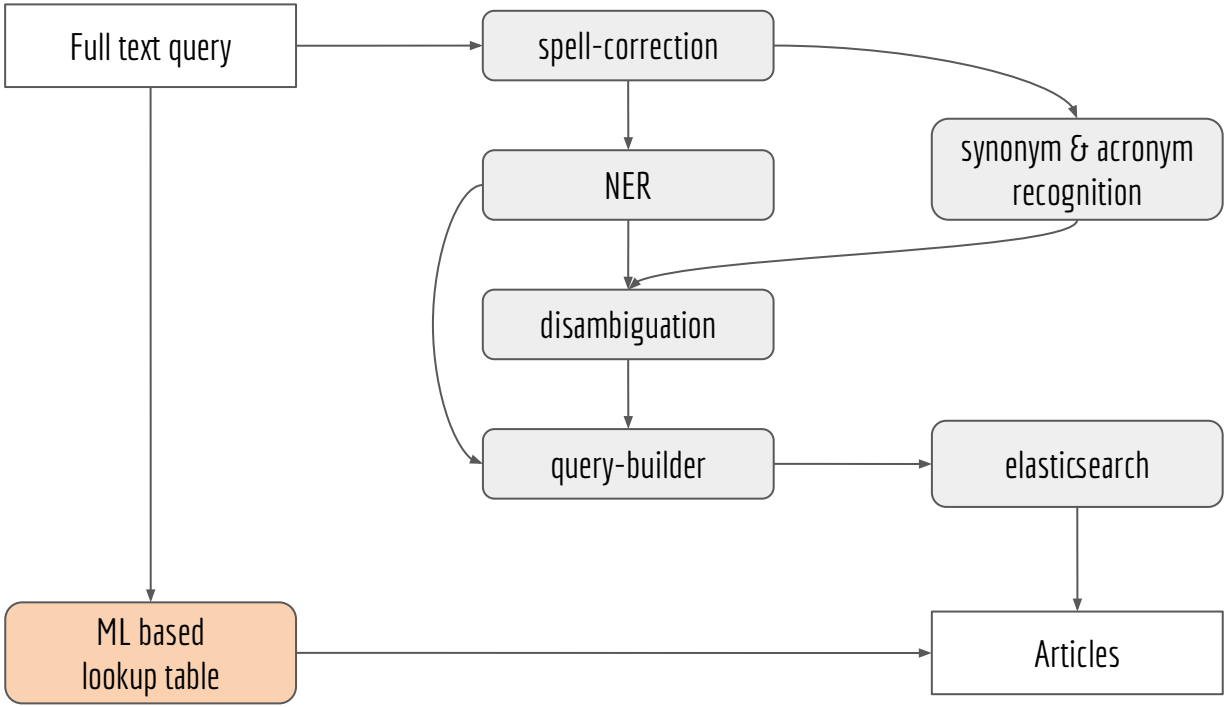
Failing classical information retrieval

“pullover patchwork”

“top figurumspielend”

“abendkleid tattoospitze”

Adding ML based solution



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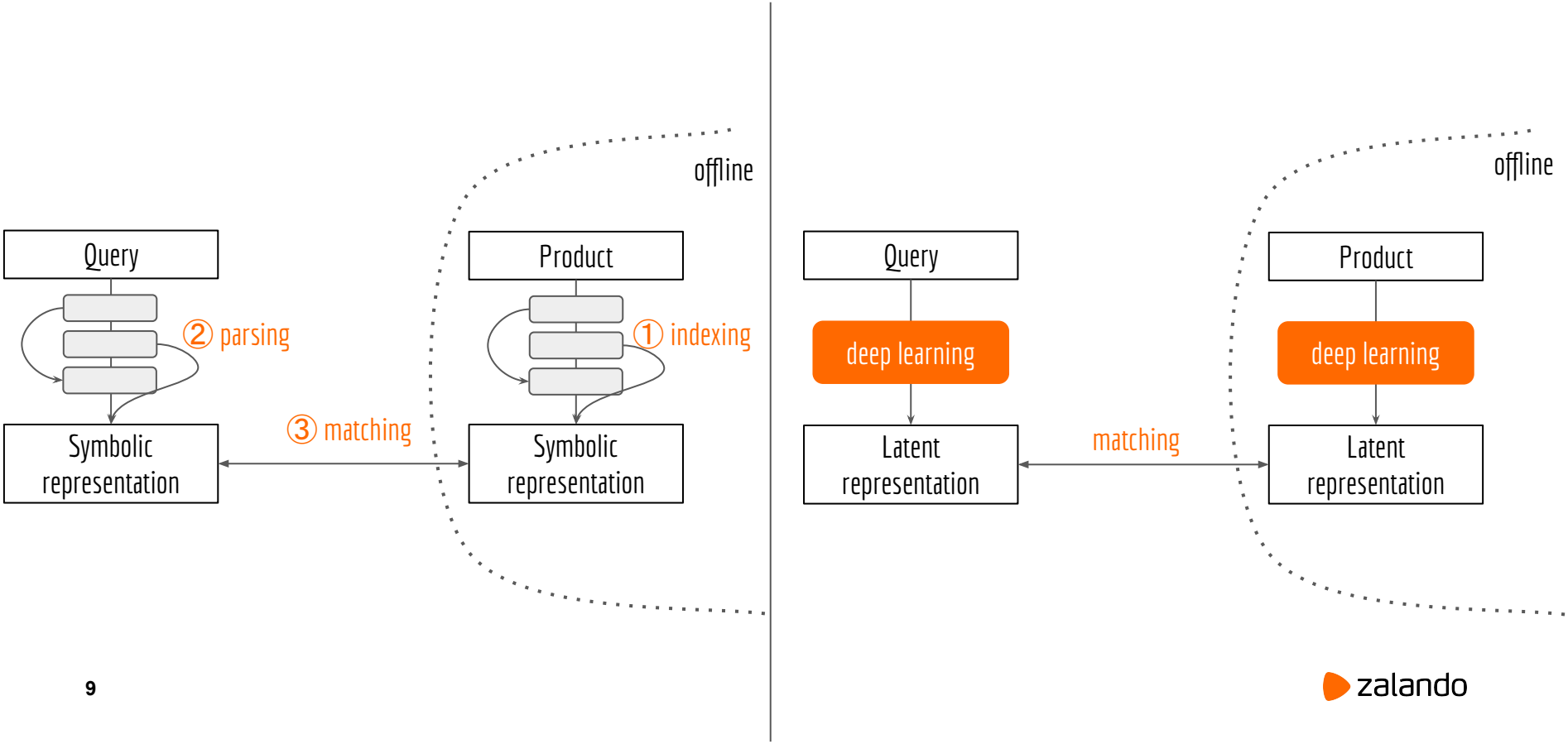
Classical system vs. end-to-end product search system



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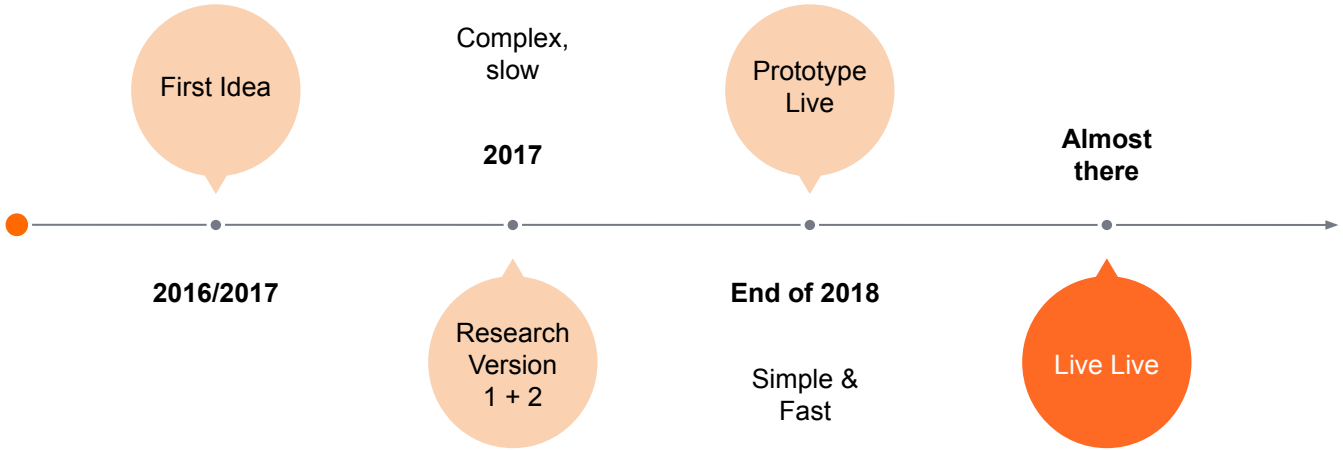
History



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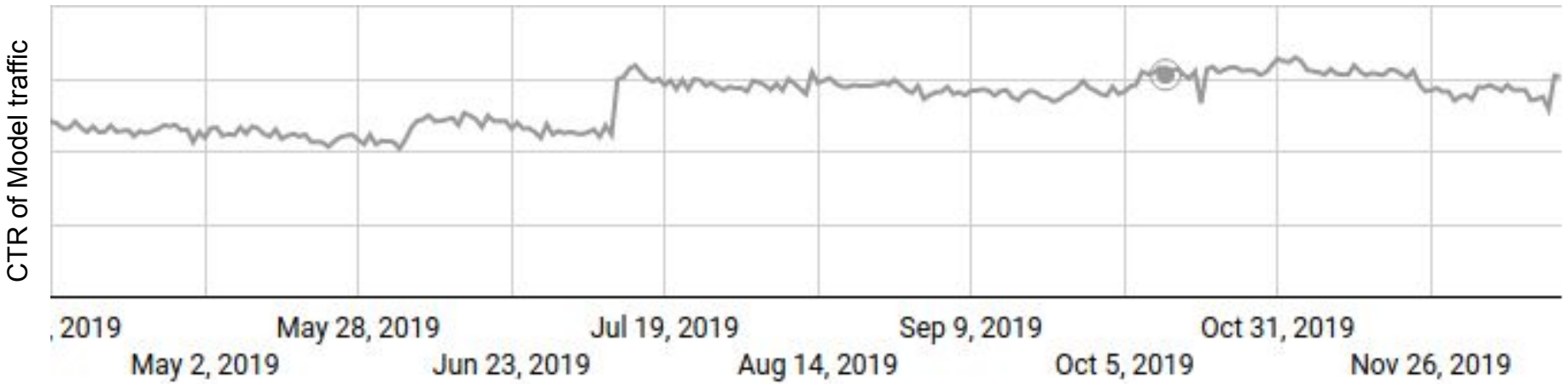
Model degradation



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Building a pipeline

 Picture from Pexels.com

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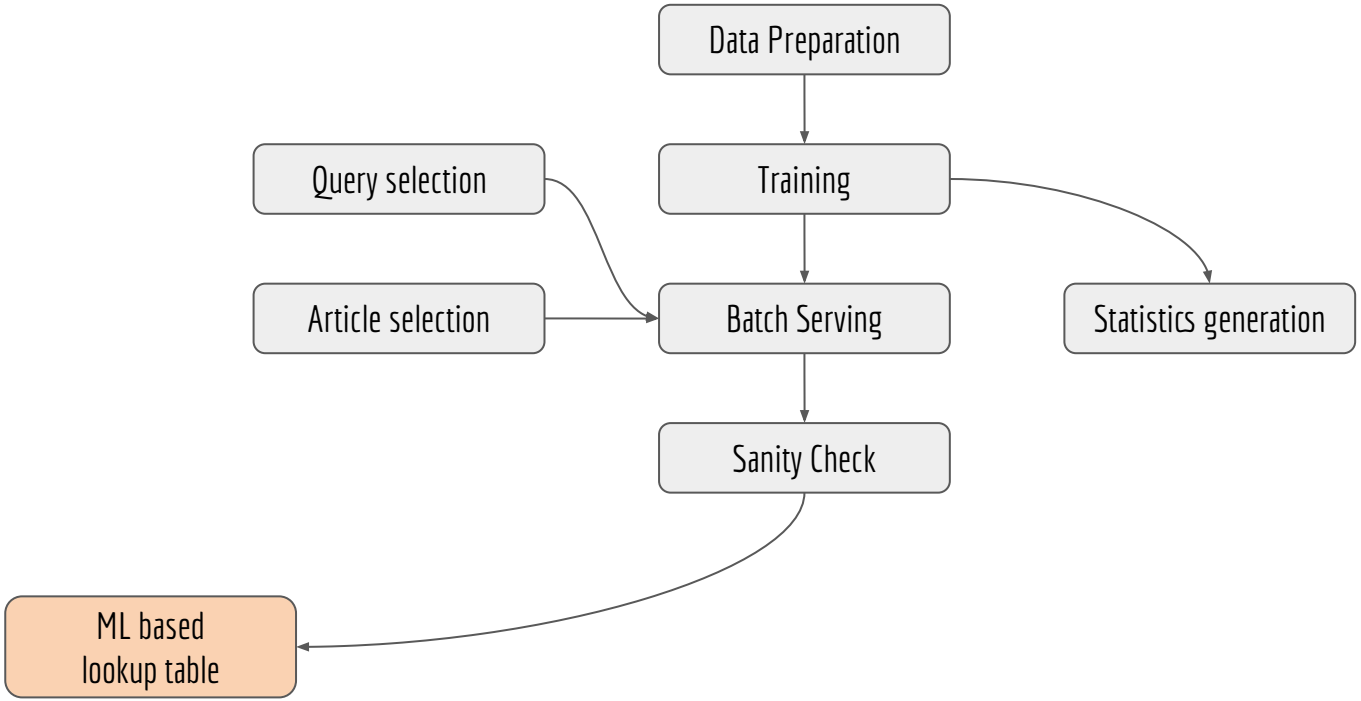
ML pipeline



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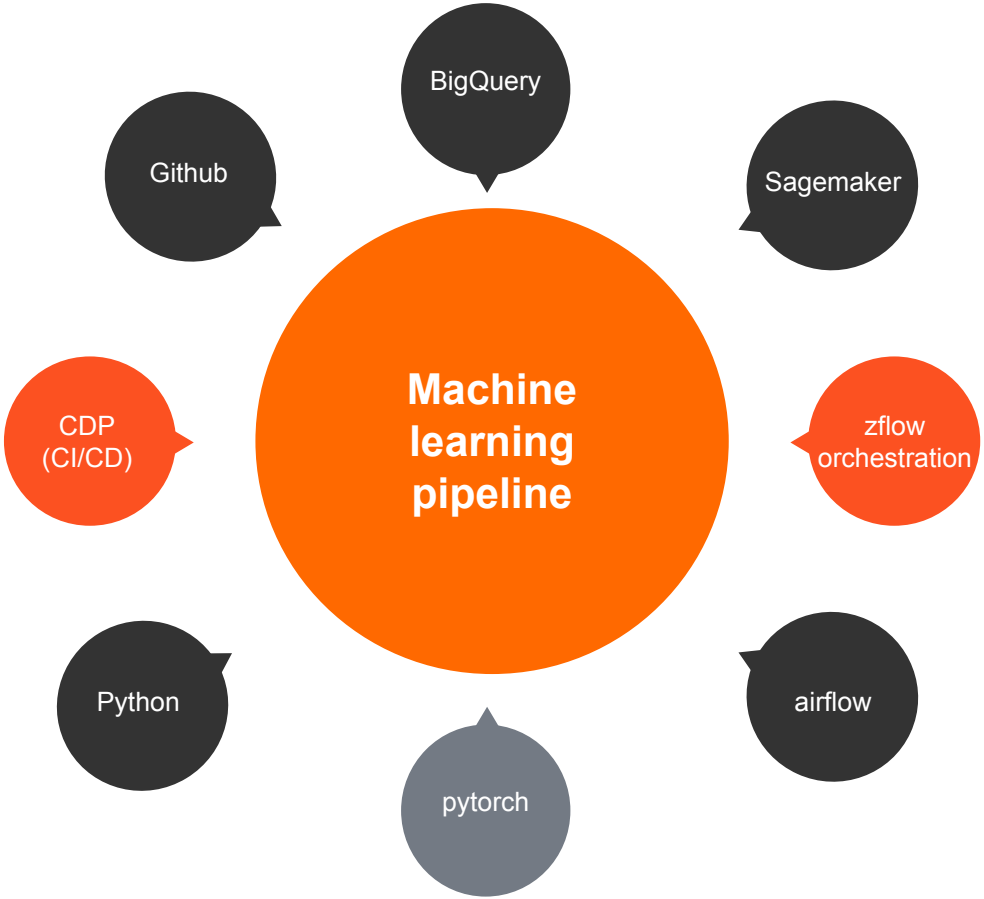
Our Technology Stack



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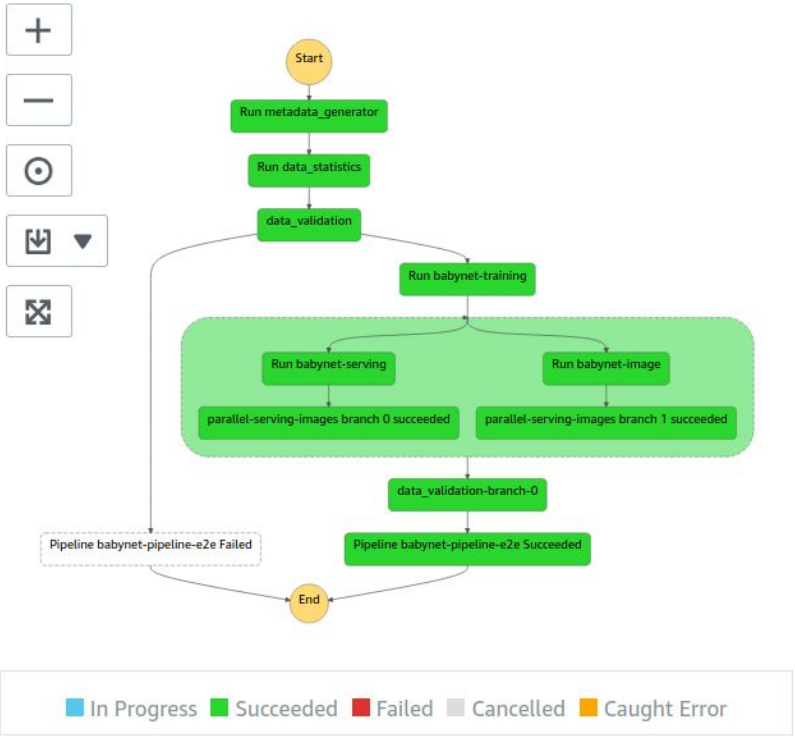
Visual workflow



Code | Step details

Name: Run babynet-image

Type: Task

Status: Succeeded

Resource: [redacted]

▶ Input

▶ Output

▶ Exception

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One-time job vs. continuous development
“Obvious decisions”

Complex model vs. simple model

Batch vs. live

Manual vs. automated

Training cadence (daily, weekly, monthly, irregularly)

One-time job vs. continuous development
“Hidden decisions”

Fast now vs. fast, maintainable, robust later

Scripting vs. Software Development

Talk, talk talk!

 Picture from Pexels.com

Testing is hard

 Picture from Pexels.com

Configuration is complex

 Picture from Pexels.com

Follow standards & best practices

 Picture from Pexels.com

Do clean code

```python
def p(i):
    s = i.split("|")
    d = s[0].lower()
    # Cleaning the price string into byte number representation and converting it to cents
    p = int(float(s[1].replace(",", ".").replace("€", "")) * 100)
    return d, p
```

BÄÄÄH

```python
from collections import namedtuple

Article = namedtuple("Article", ["description", "price"])


def parse_article(article_string):
    splitted = article_string.split("|")
    description = splitted[0].lower()

    cleaned_price_string = splitted[1].replace(",", ".").replace("€", "")
    price_in_cents = int(float(cleaned_price_string) * 100)

    return Article(description, price_in_cents)
```

Nice

About good (ML) code

Correct

Simple functions

Written for others to read

Accessible business logic

Pipeline steps are independently executable

Producing good code

1) Feature
2) Correct
3) Readable
4) Simple
5) Readable
6) Feature is still correct?
    a) No => go to 1)
    b) Yes => Happy days!

Be a scout: Leave the code cleaner than you found it.

Future work

Improve Model

Monitoring

Model influences training data

Add more use cases

Replace tradition IR search

Takeaways

Simple model does the job

Pipeline building takes a lot of time

Train code craftsmanship

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We hire:

Senior Search Engineer

Principal Research Engineer - Search

Principal Product Manager - Search

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