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THE MODERN ARCHITECTURE OF SEARCH

Alaa Elhadba Mikio Braun

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1500+ Brands

20 Million Customers

15 European Countries

Alaa Elhadba

Search Engineer

alaa.elhadba@zalando.de

@alaa_elhadba

Mikio Braun

Delivery Lead

mikio.braun@zalando.de

@mikiobraun

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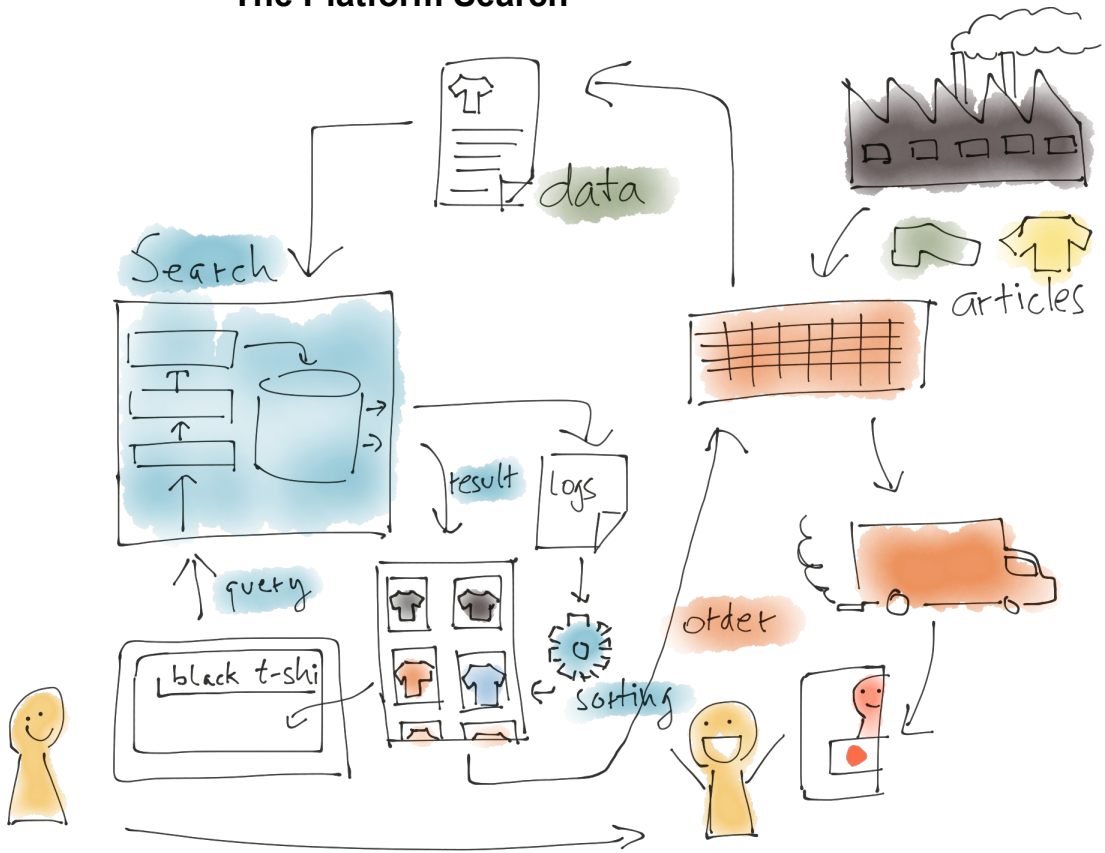
The Platform Search

The platform search is a gateway offering search as a service for merchants and retailers. Its current focus is integration with its first and main stakeholder the fashion store.



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OLD SKOOL SEARCH

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STRING MATCHING

White adidas performance sneakers

```
{
    "name": "STAN SMITH - Sneaker low - running white/collegiate red",
    "color": "white",
    "silhouette_code": "sneaker",
    "sku": "AD115B01K-A13",
    "url_key": "adidas-originals-stan-smith-sneaker-low-ad115b01k-a13",
    "brand": {
      "name": "adidas Originals",
      "code": "AD1",
      "url": "adidas-originals",
      "image_url": "86ba648f-737c-4b71-b13e-1354db4bbe50.jpg"
    },
    "categories": [
        "Katalog",
        "Damen",
        "Schuhe",
        "Sneaker"
    ],
    "in_stock": true
}
```


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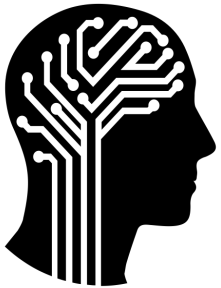

A DATA-DRIVEN WORLD

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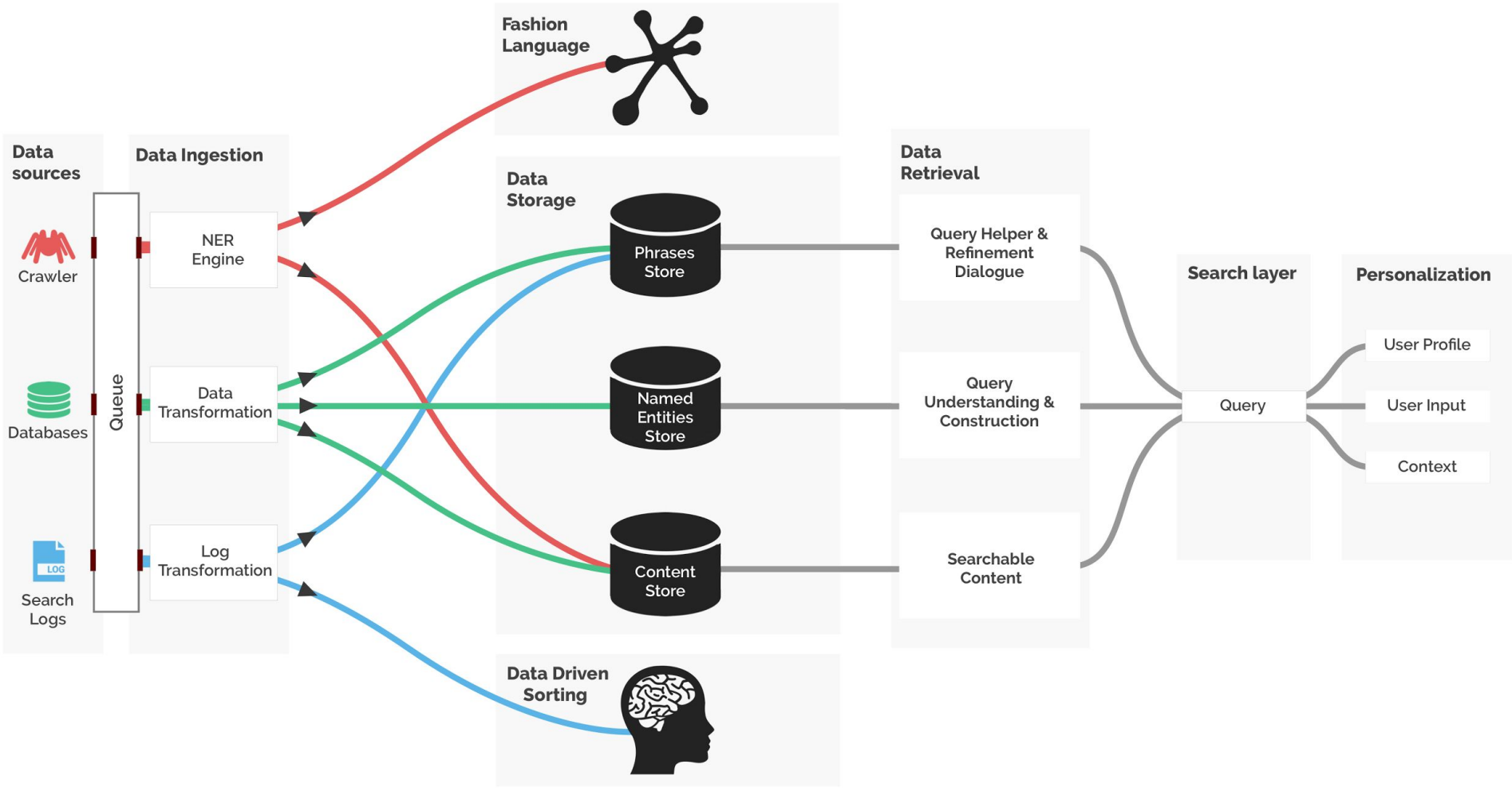
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DATA INGESTION

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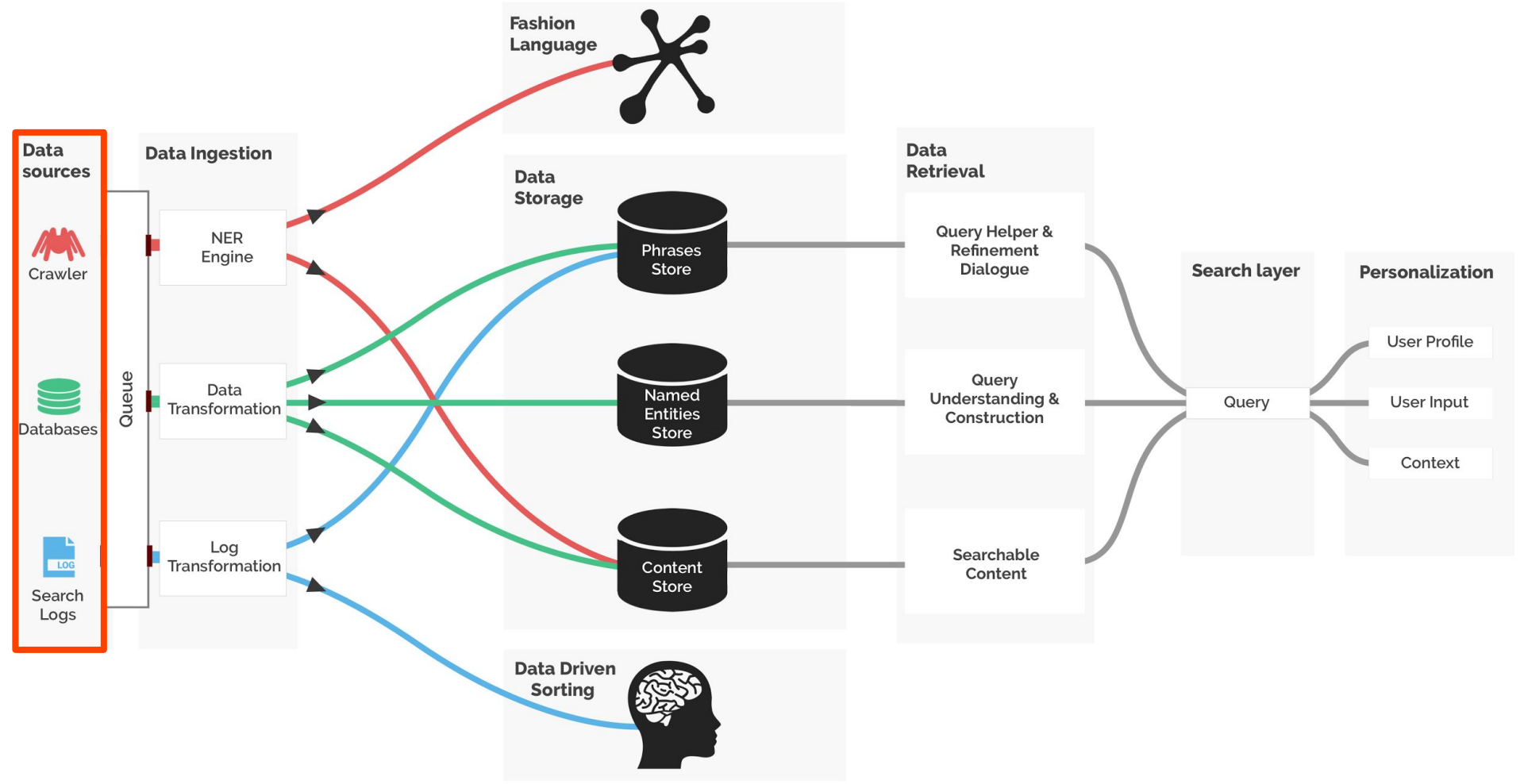
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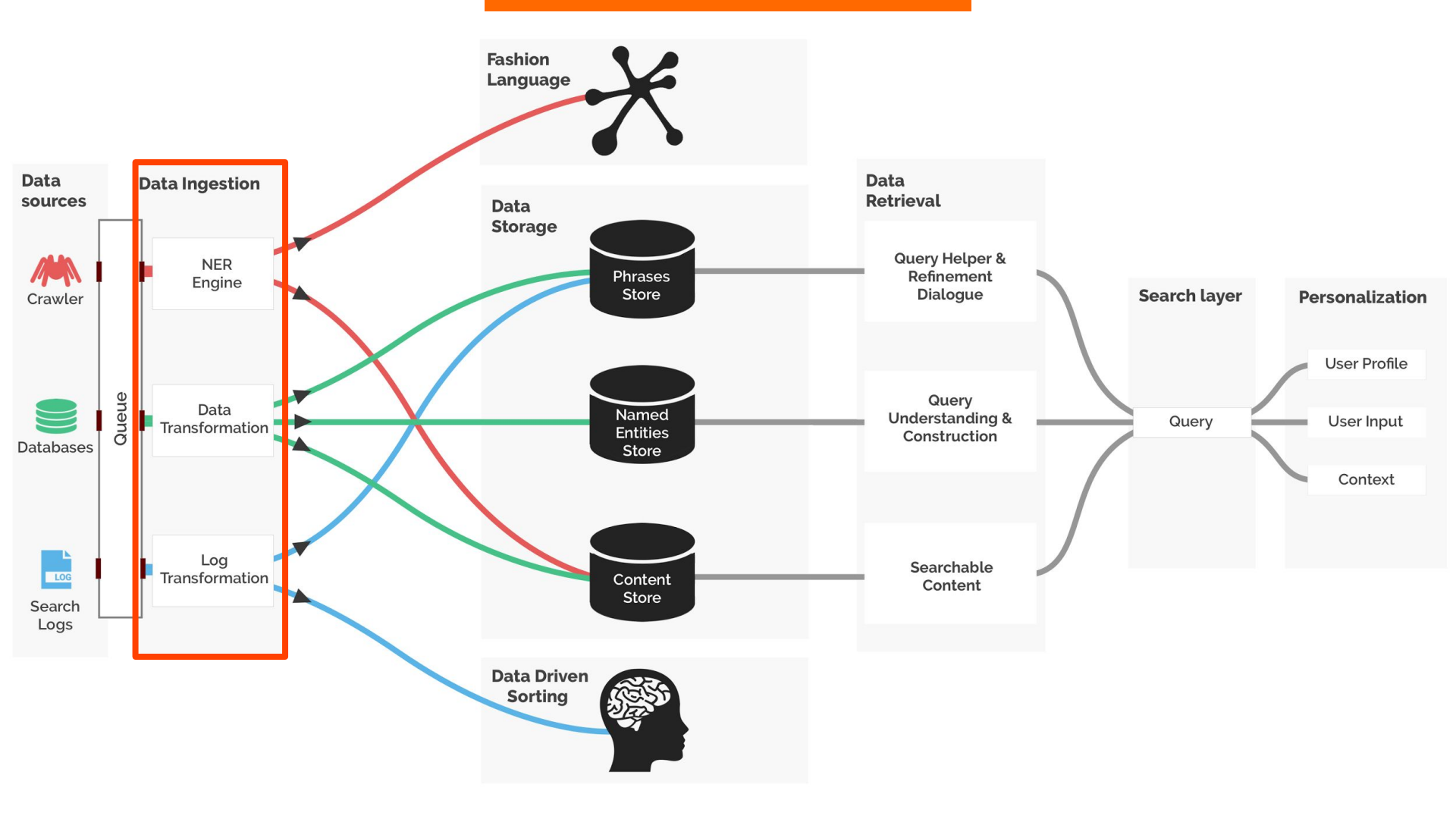
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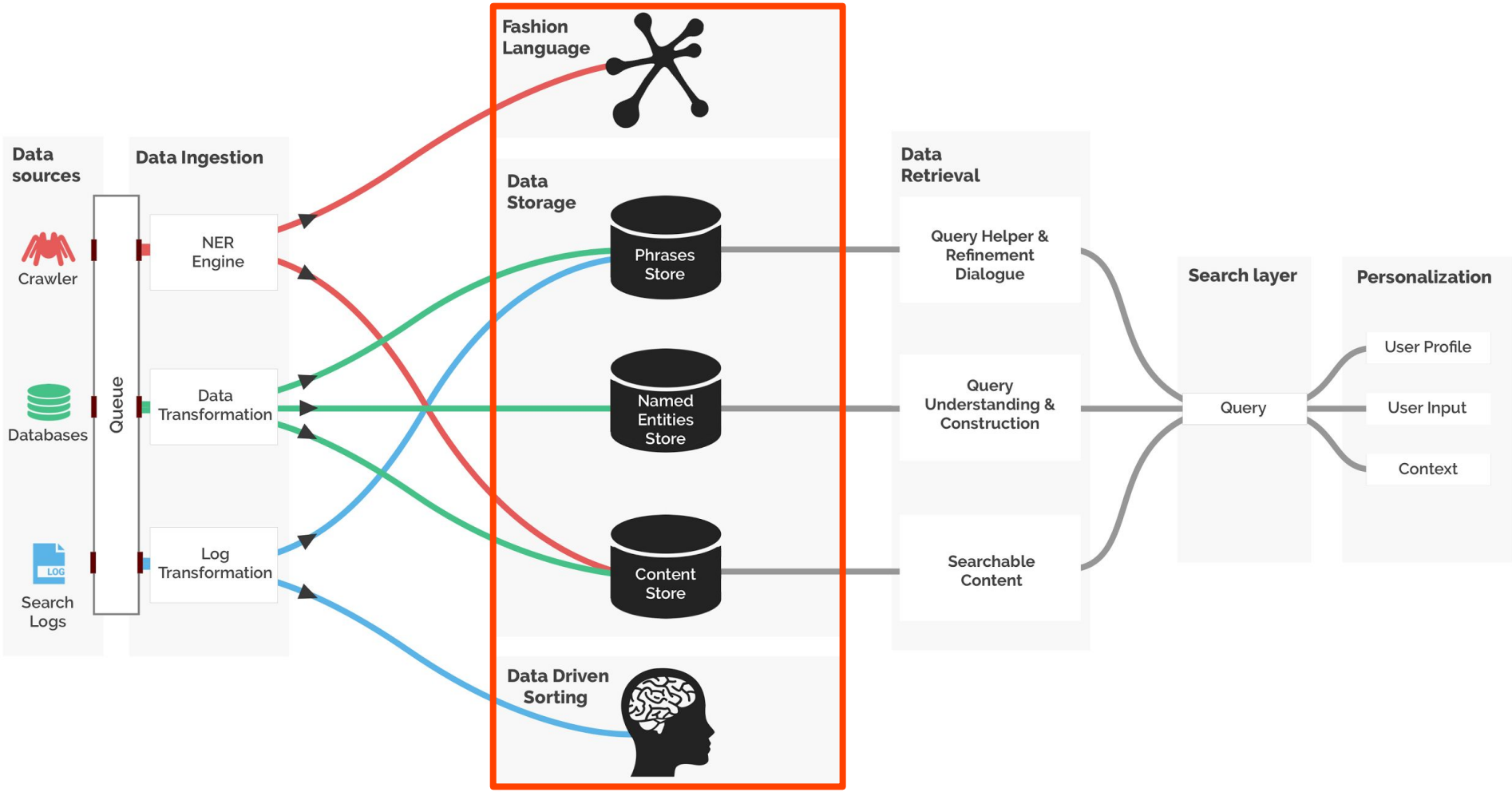
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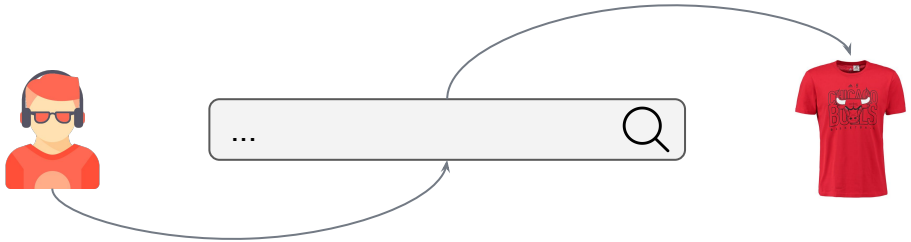
THE STORY OF A QUERY



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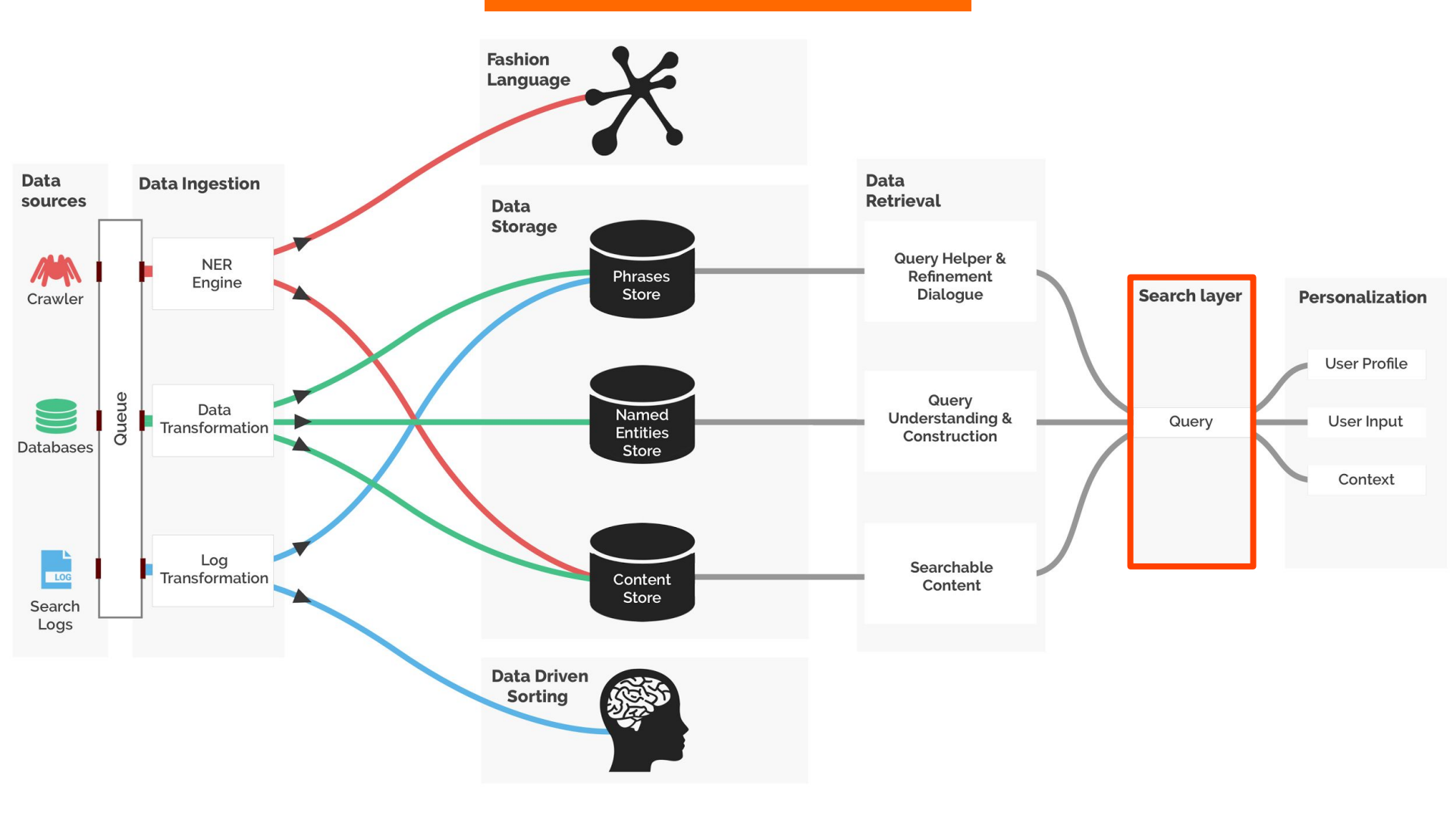
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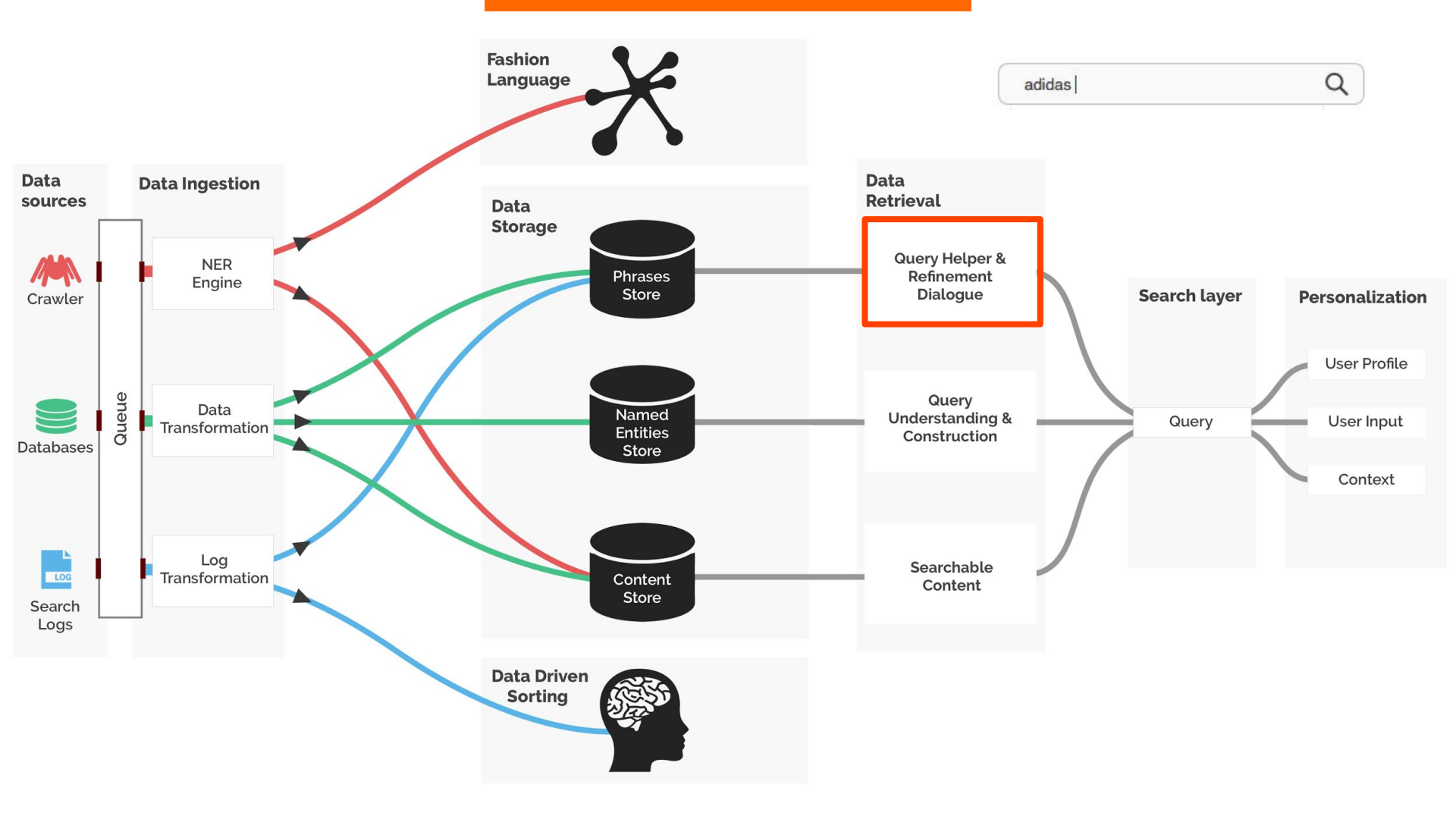
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adidas
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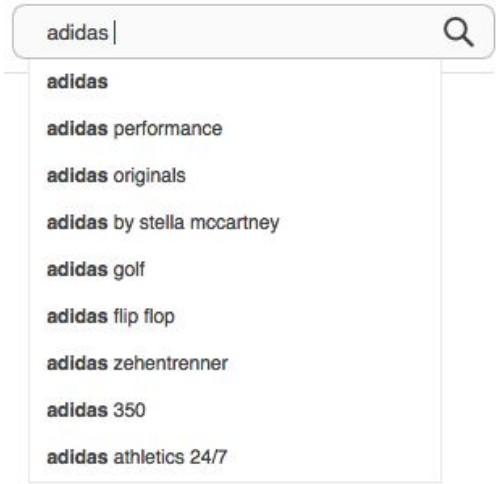
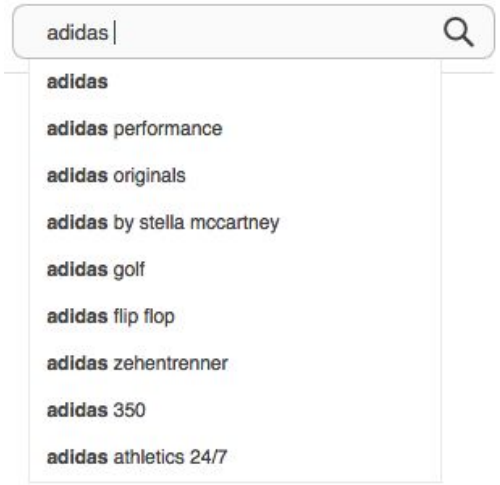
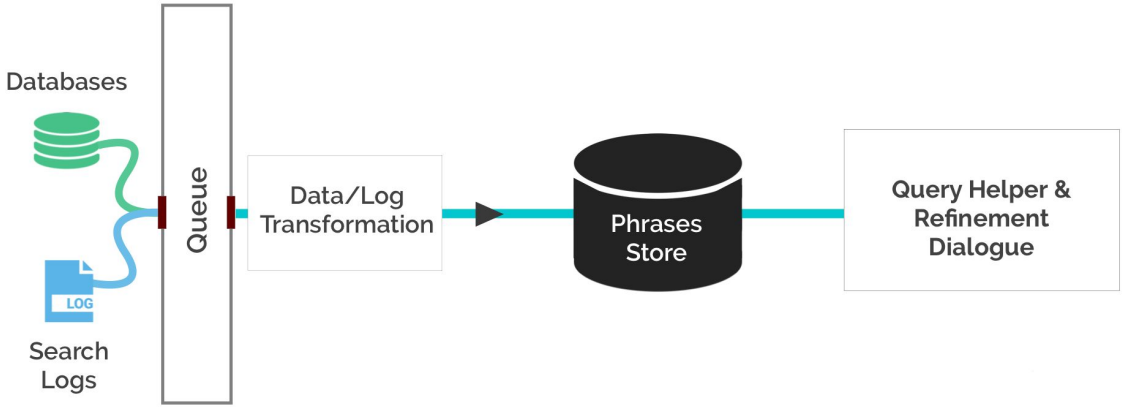
AUTO-COMPLETION



- Correct spell-error
- Predict the next word
- Understand synonym/acronym (`"Michael Kors" <-> "MK"`)
- Disambiguate (`"jack" -> "Jack & Jones"` or `"Jacke"`)
- Be personalized (sensitive to the context)
- Learn from user-feedback
- Have diverse results

GENERATING PHRASES





Brand + Color + Material + Category + Name + ... =

adidas schwarze schuhe

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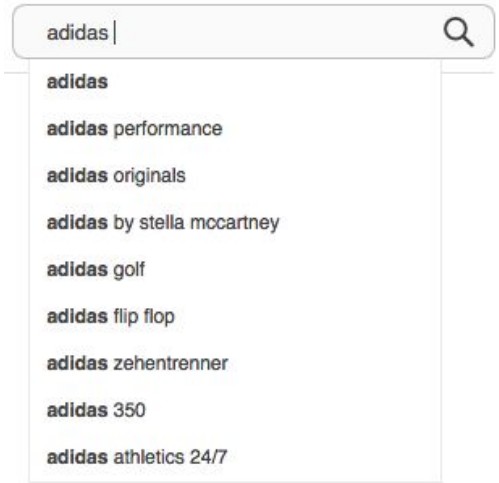
RANKING PHRASES



Score:

- Hit position
- Term frequency
- Entity preference (Entity bias)
- Brevity (Penalizing long queries that match multiple entities)
- User click (click count and recency bias)

AUTO-SUGGEST

lange kleide

Autosuggest:

- Did you mean ? maxikleid

semantic space instead of text matching

maxikleid

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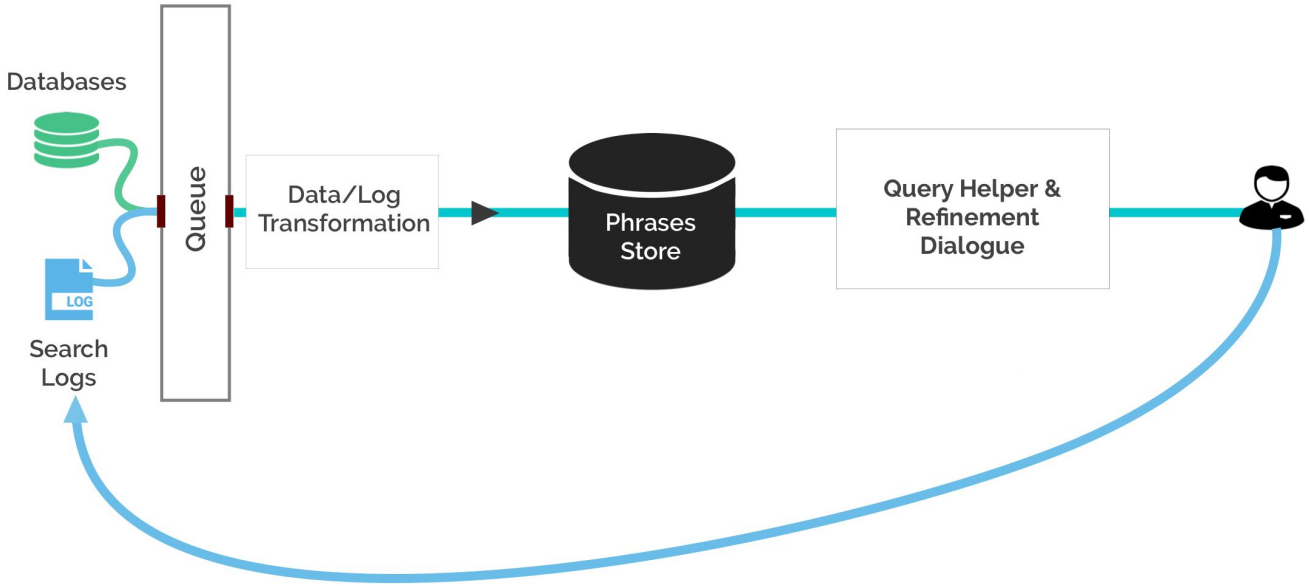
PERSONALISATION



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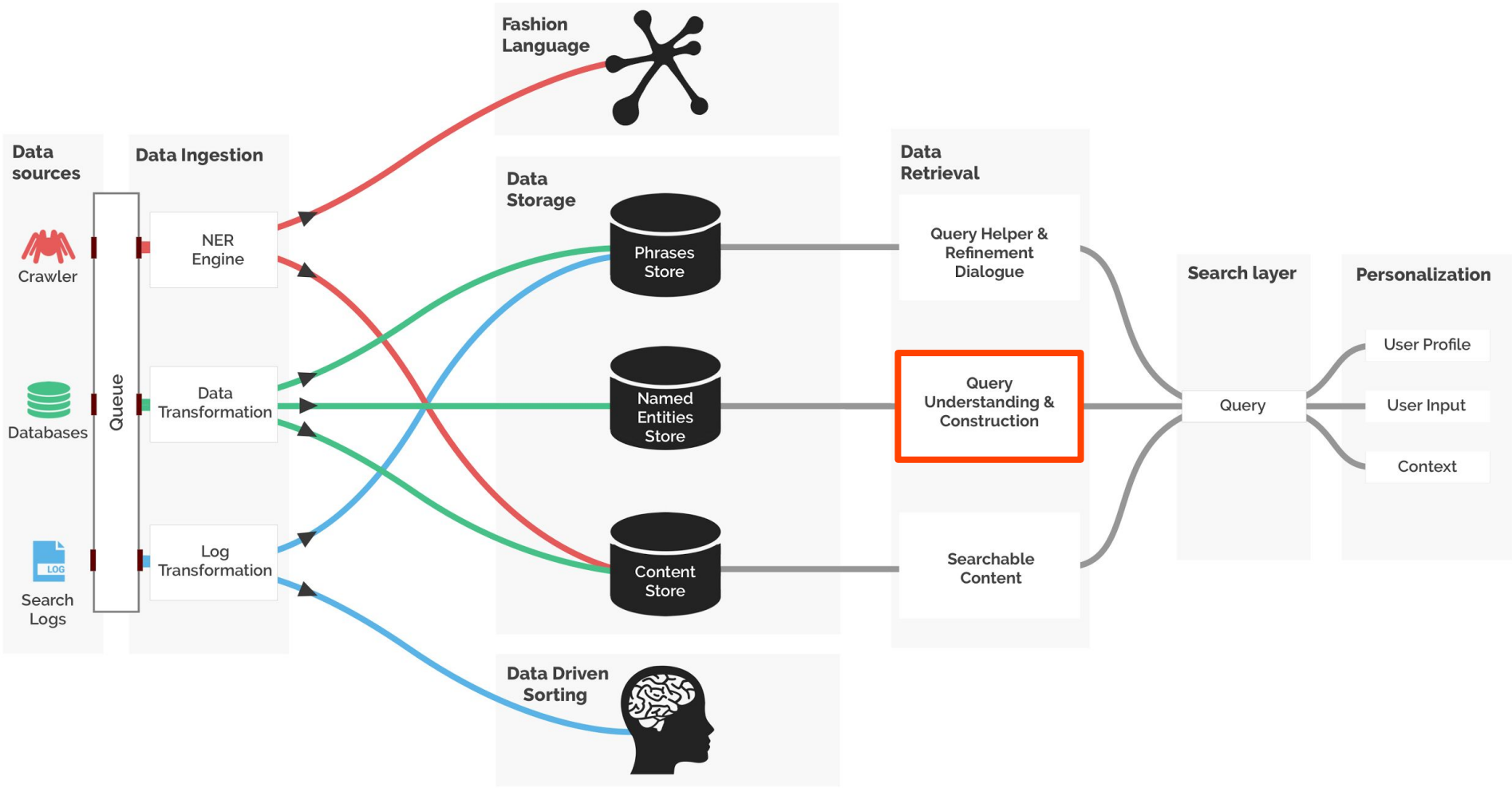
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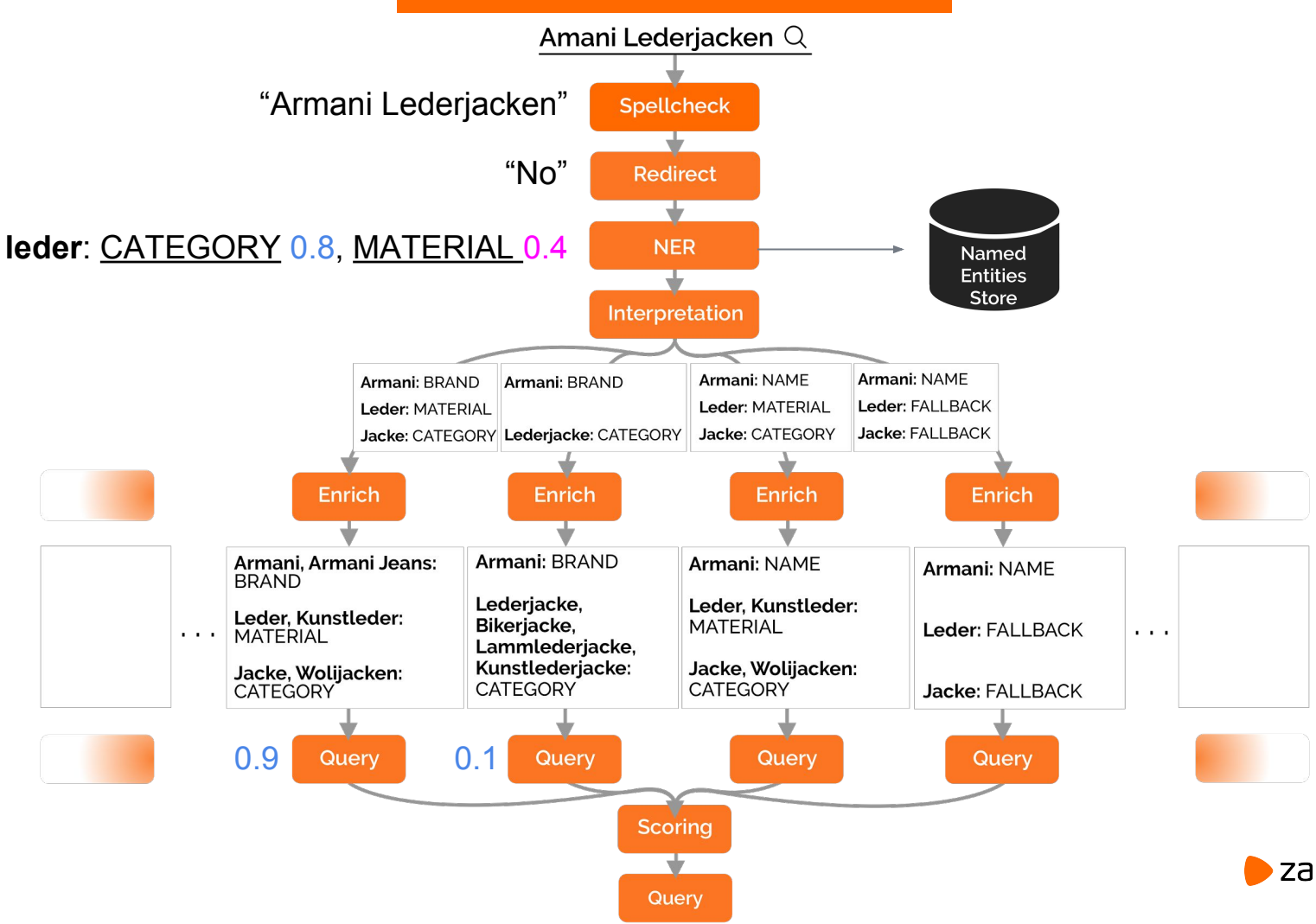
Amani Lederjacken
"Armani Lederjacken"
Spellcheck
"No"
Redirect
leder: CATEGORY 0.8, MATERIAL 0.4
NER
Named Entities Store
Interpretation
Armani: BRAND
Leder: MATERIAL
Jacke: CATEGORY
Armani: BRAND
Lederjacke: CATEGORY
Armani: NAME
Leder: MATERIAL
Jacke: CATEGORY
Armani: NAME
Leder: FALLBACK
Jacke: FALLBACK
Enrich
Enrich
Enrich
Enrich
Armani, Armani Jeans: BRAND
Leder, Kunstleder: MATERIAL
Jacke, Wolijacken: CATEGORY
Armani: BRAND
Lederjacke, Bikerjacke, Lammlederjacke, Kunstlederjacke: CATEGORY
Armani: NAME
Leder, Kunstleder: MATERIAL
Jacke, Wolijacken: CATEGORY
Armani: NAME
Leder: FALLBACK
Jacke: FALLBACK
0.9
Query
0.1
Query
Query
Query
Scoring
Query

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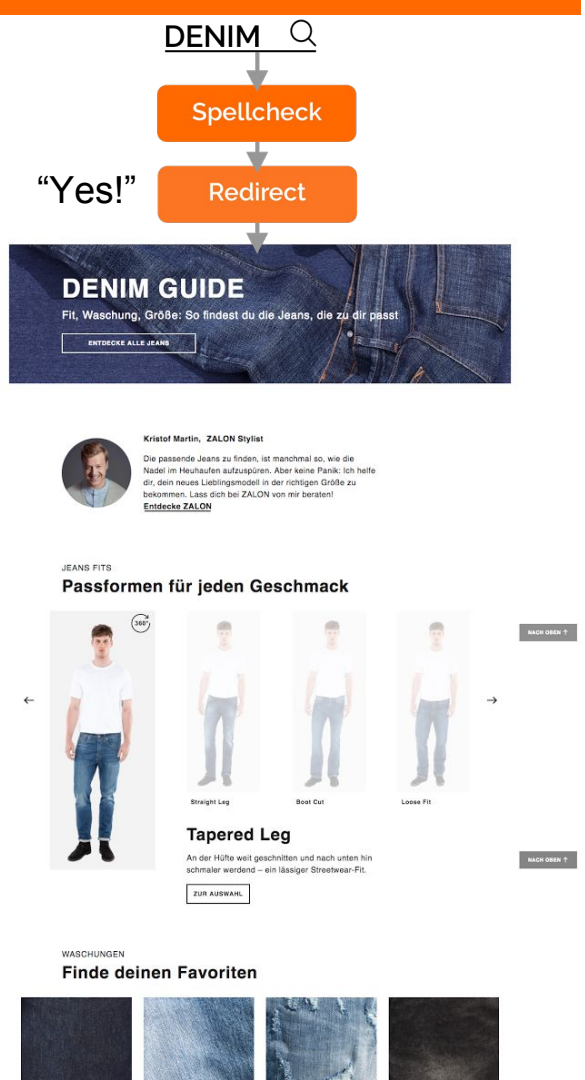
GUIDED SEARCH



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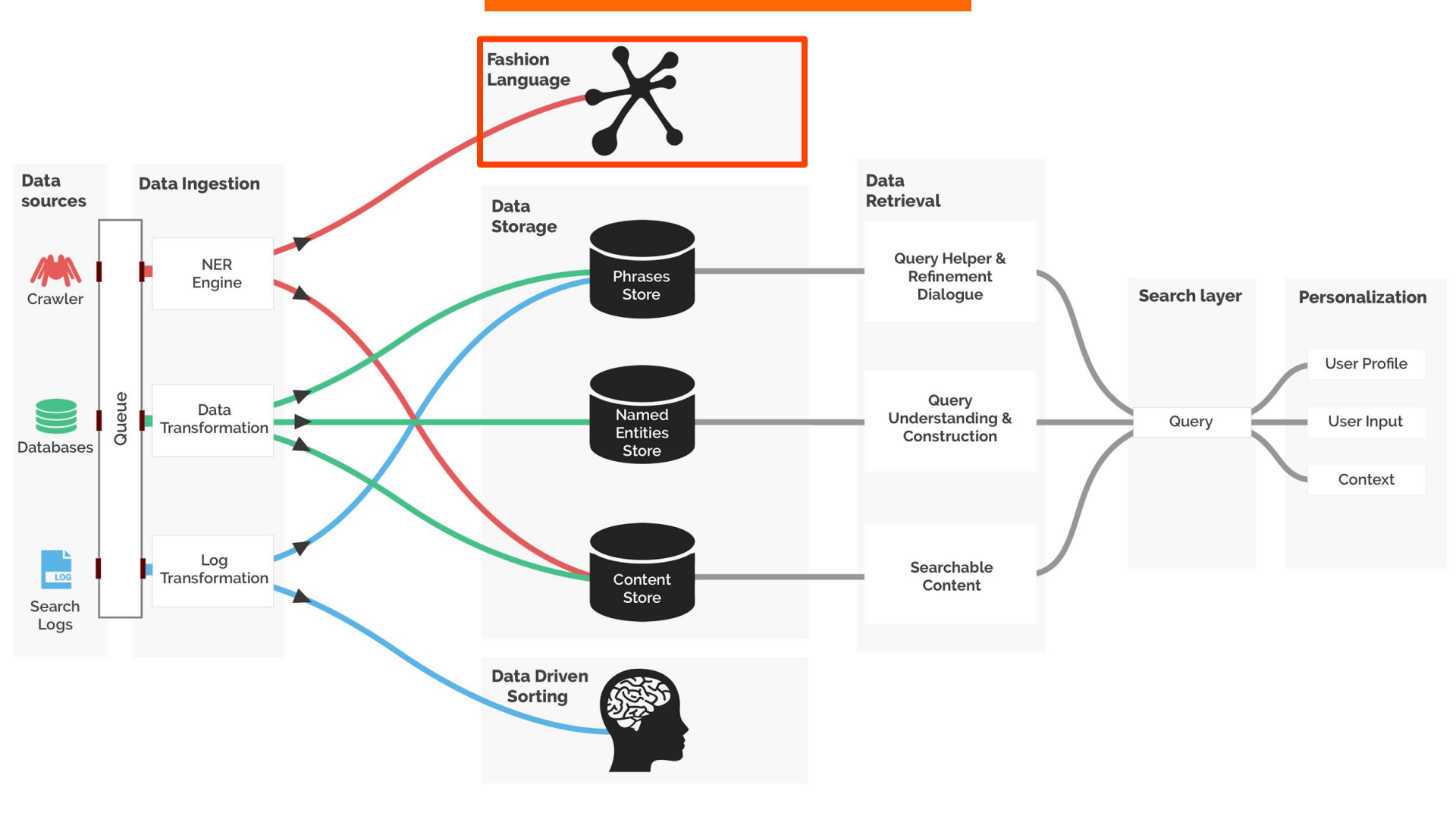
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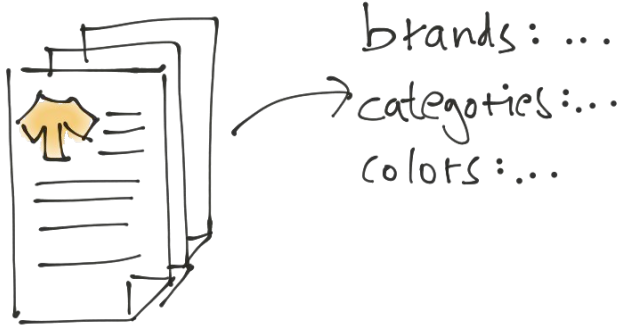
FASHION KNOWLEDGE BEYOND ARTICLE DATA



Article data already produces a ton of data.

But what about…?

New trends

"boyfriend jeans"

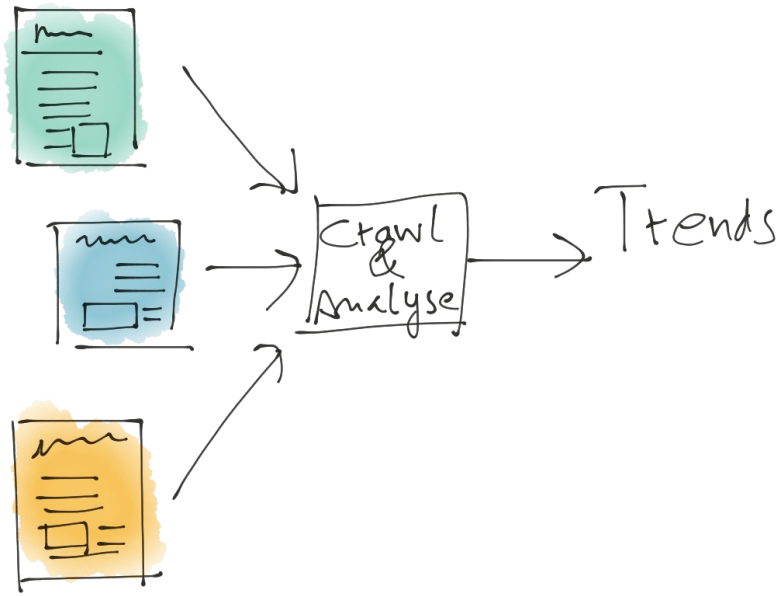
"Hobo" "80s"

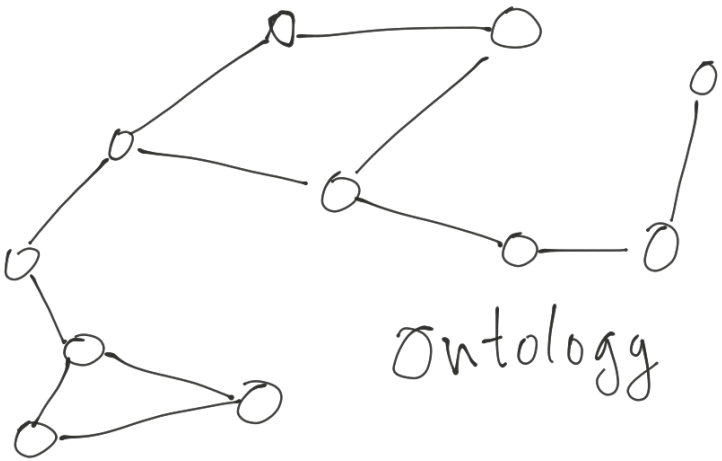
Occasions

"Wedding"

"Party"

FASHION KNOWLEDGE BEYOND ARTICLE DATA





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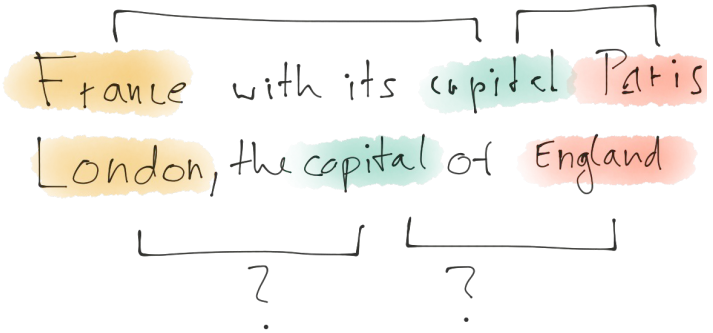
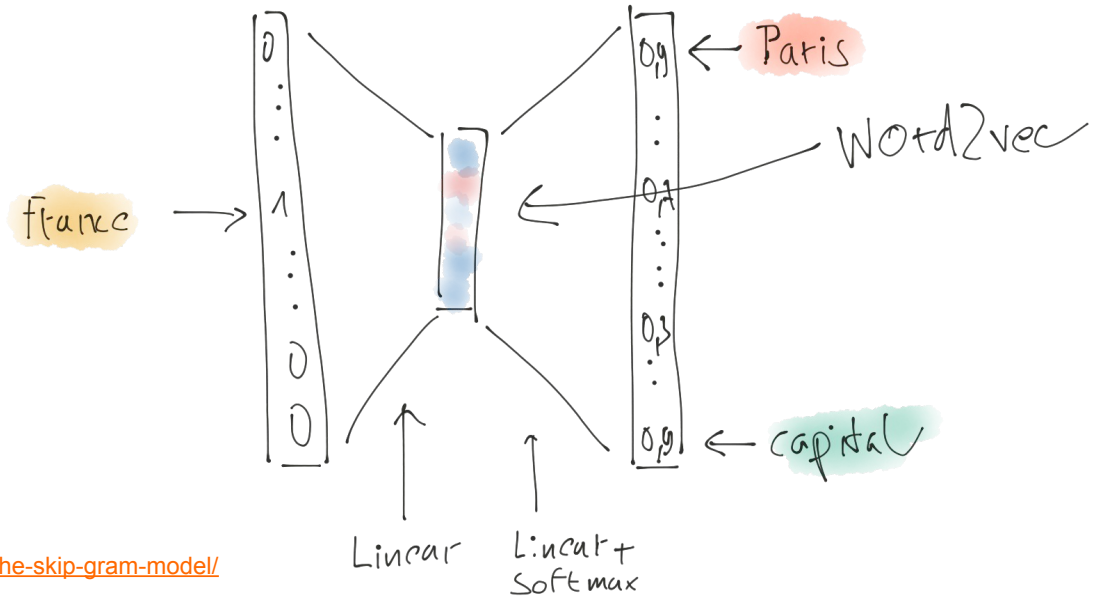
DATA DRIVEN SYNONYMS - WORD2VEC





Excellent post: http://mccormickml.com/2016/04/19/word2vec-tutorial-the-skip-gram-model/

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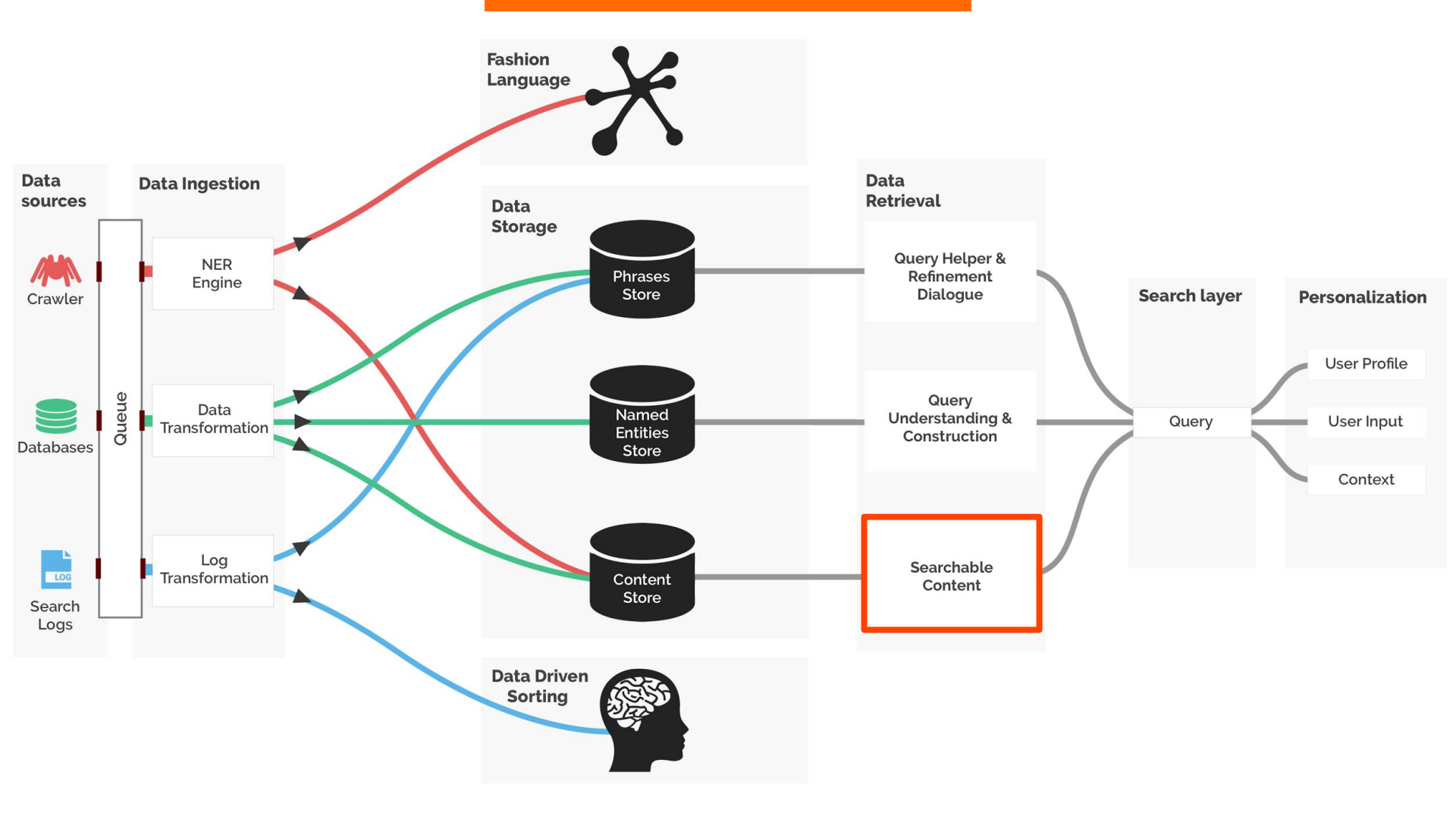
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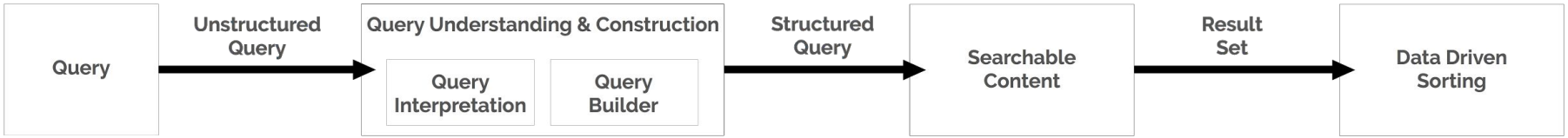
Query
Unstructured Query
Query Understanding & Construction
Query Interpretation
Query Builder
Structured Query
Searchable Content
Result Set
Data Driven Sorting

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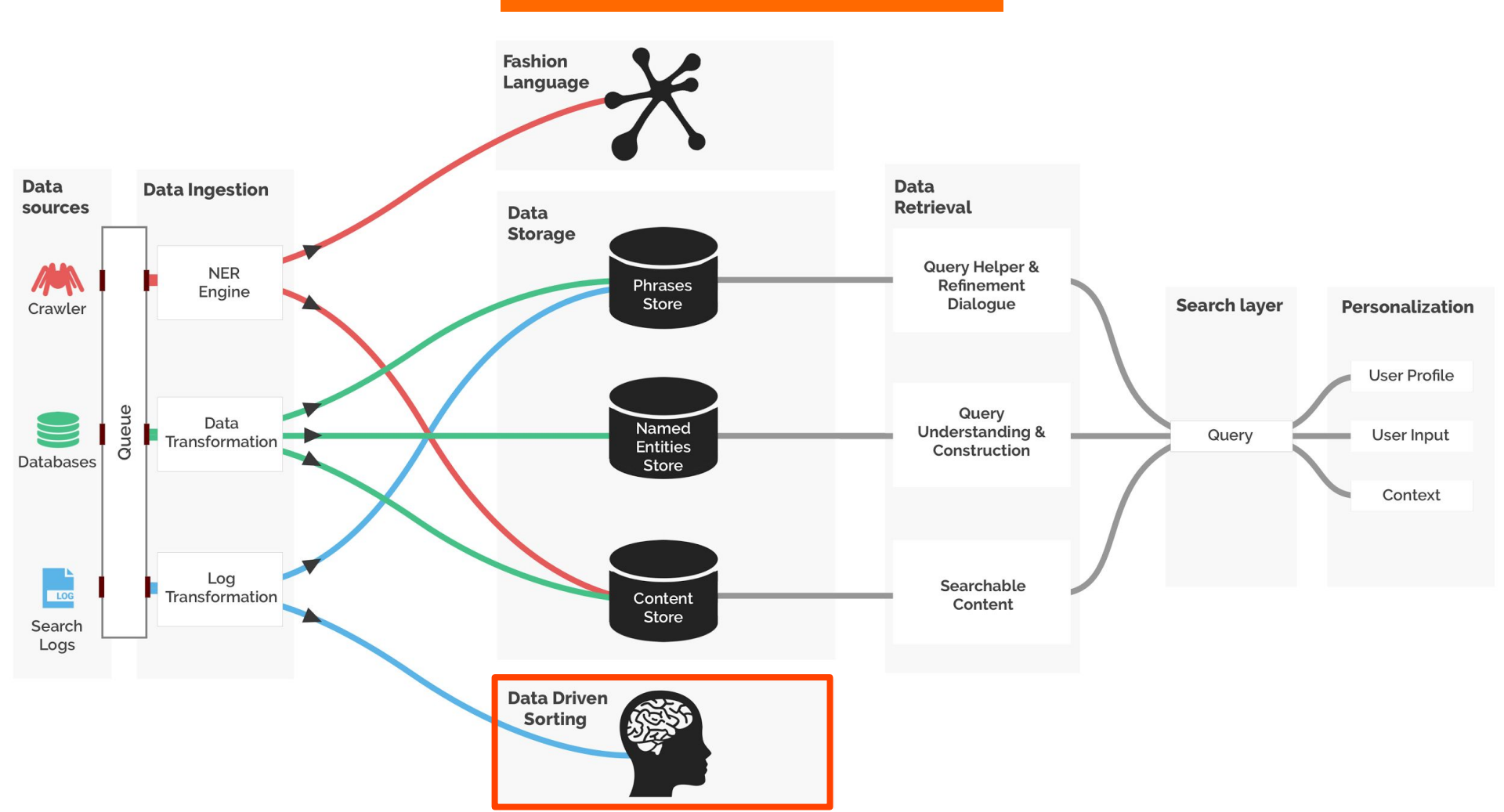
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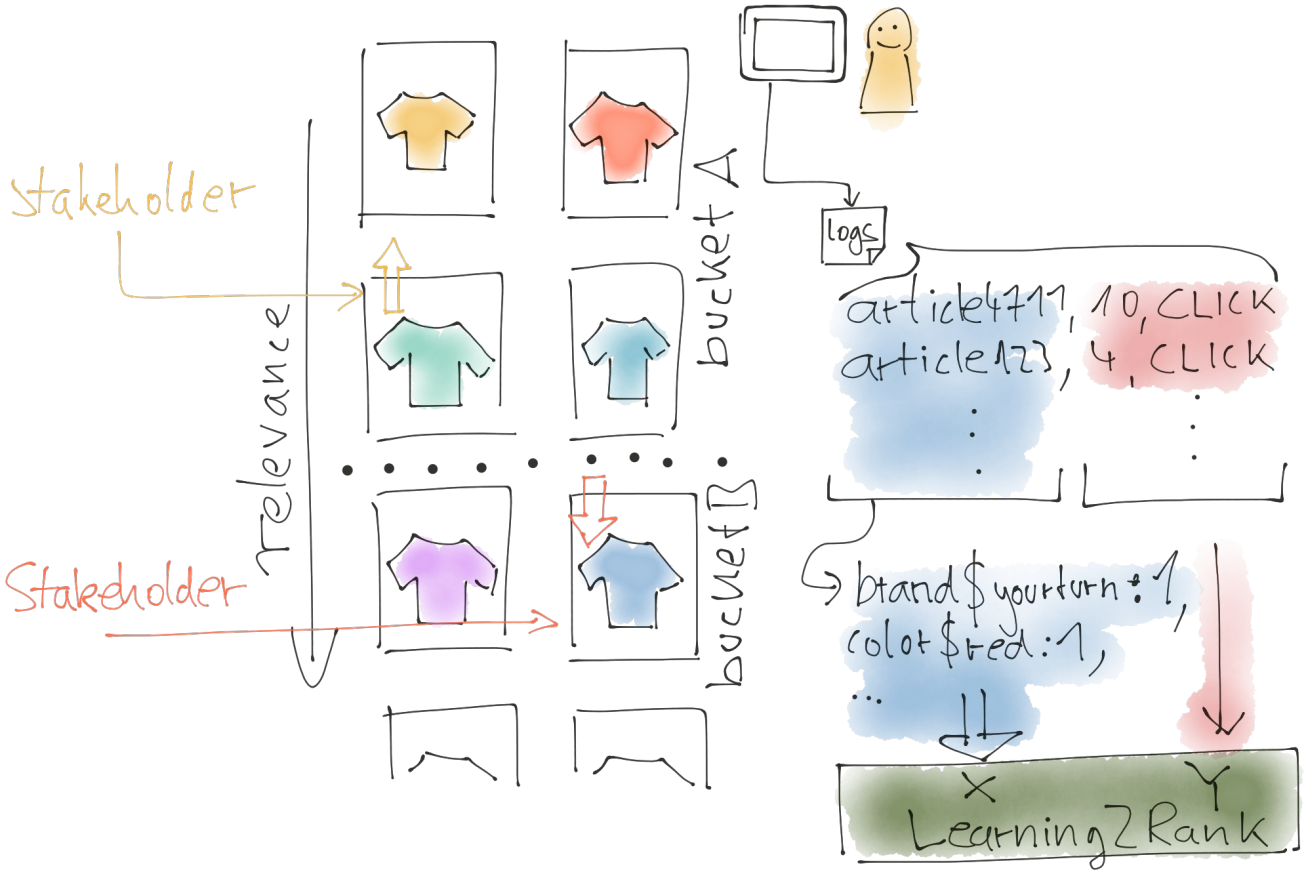
DATA DRIVEN SORTING



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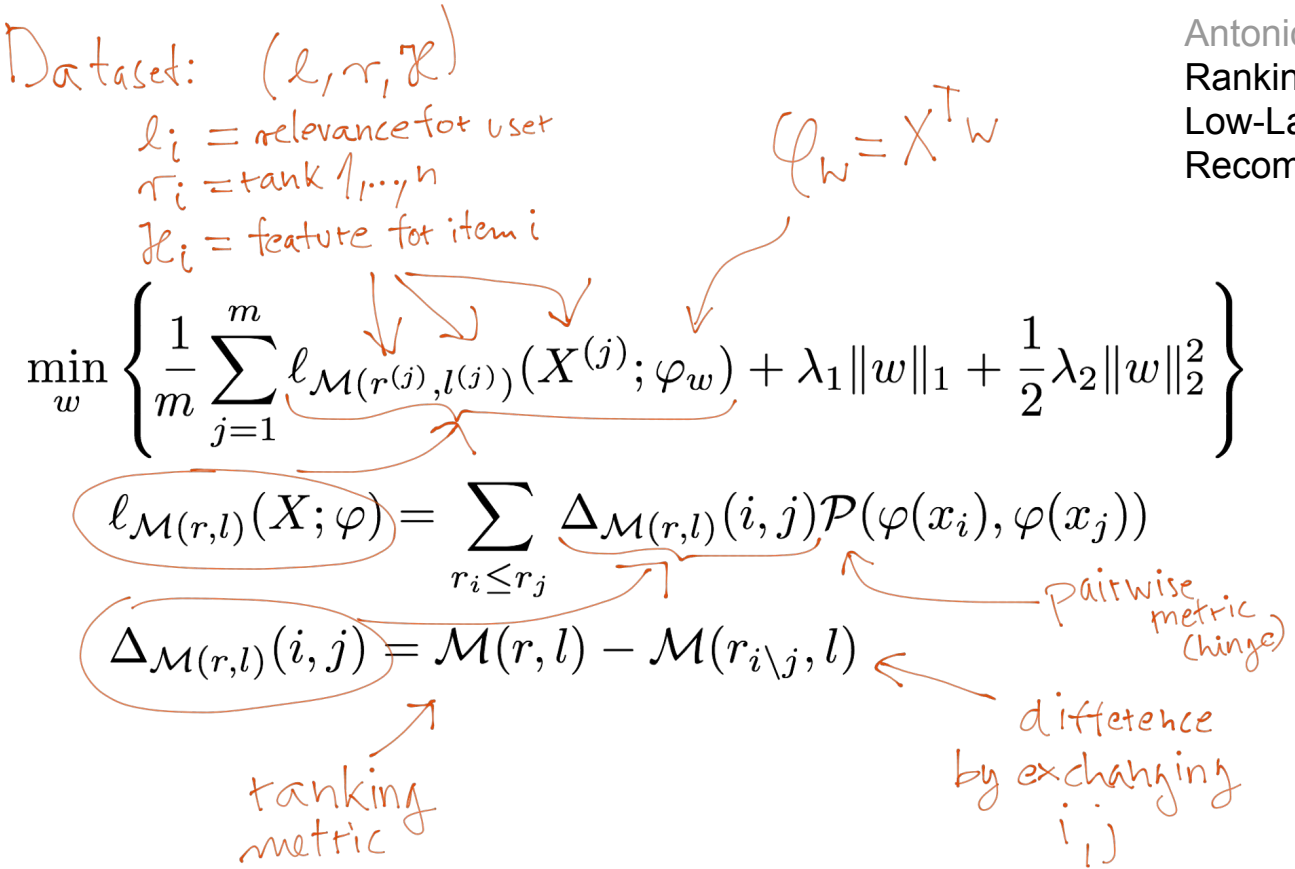
DATA DRIVEN SORTING: LEARNING TO RANK

Antonio Freno et al. "One-Pass Ranking Models for Low-Latency Product Recommendations", KDD 2015



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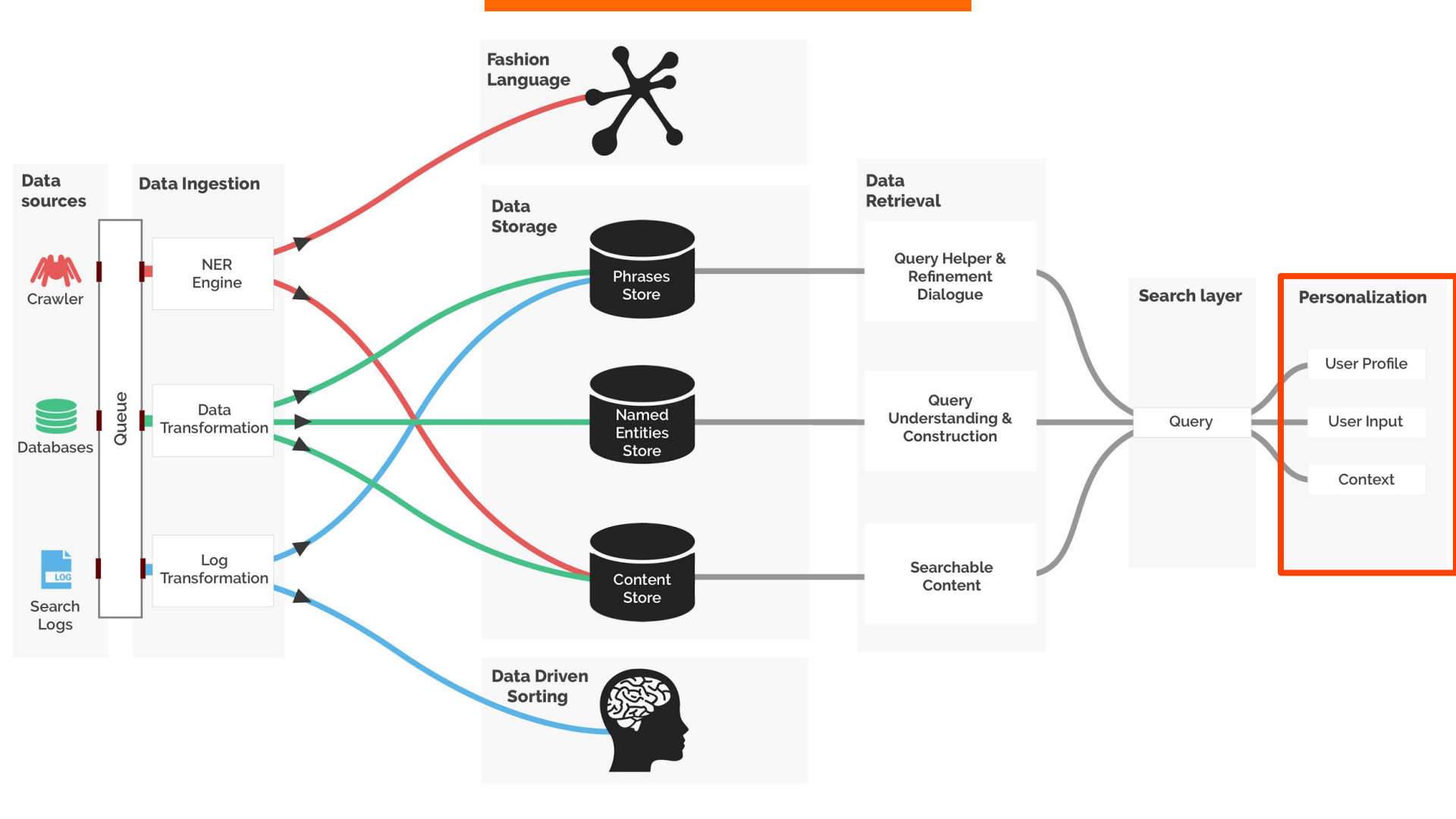
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PERSONALISATION

- Goal: Find the most relevant articles for each user.
- Give the customer the feeling, search is understanding what their needs are.
- Essentially part of every step: Query Helper, Query Analysis, Personalization.
- From simple methods (history, last orders) to full blown complex models (personalized ranking models)

THE END