Improving search experience with a taxonomy in the fashion domain

George Cushen & Pedro Balage

Taxonomy Boot Camp 2019

FARFETCH

Farfetch at a glance

$1.4 Billion*
Gross Merchandise Value

1.7 million**
Active Marketplace consumers

> 2.9 Million*
Orders on Marketplace

$601**
AOV on Marketplace

> 1,000**
Luxury sellers on the Marketplace

> 3,000*
Brands available for consumers to shop

> 3,000*
Employees across 13 countries

15**
Marketplace language sites

$307 Billion
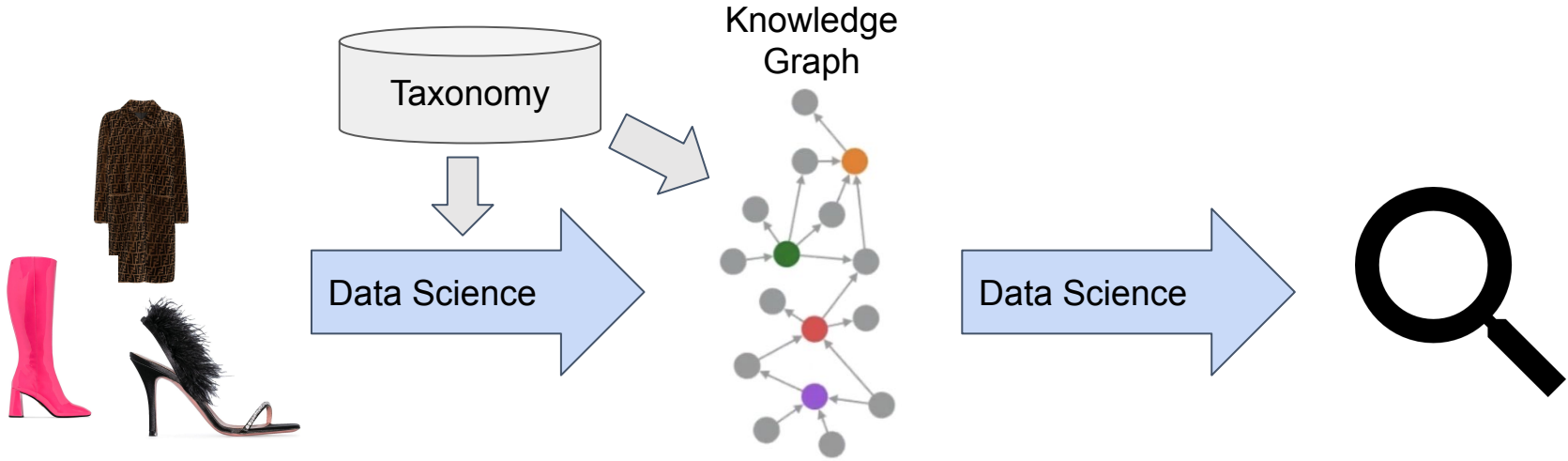Size of personal luxury good industry (Bain estimates)

*Correct for full year 2018 **As at Q1 2019

FARFETCH

Building a Taxonomy for Fashion

Outfit available from
https://www.farfetch.com

We're mapping fashion DNA to decode personal style

📖 **Standardising** with a **unified semantic fashion taxonomy**

🏷️ **Connecting** these fashion entities with products in a **graph** via **AI**

🔍 Applying the **taxonomy** and **graph** to **improve** the **search** experience

Categorisation

Women   Men   Kids

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NEW IN   SHOP BY   DESIGNERS   CLOTHING   SHOES   BAGS   ACCESSORIES   JEWELLERY   PRE-OWNED   SALE

Search

CLOTHING

All clothing

Beachwear

Coats

Denim

Dresses

Jackets

Jumpsuits & all in ones

Knitwear

Lingerie

Shorts

Skirts

Tailoring

Tops

Trousers

Sale clothing

ACTIVEWEAR

All activewear

Gym & training

Running

Ski & snowboard

Swim & surf

Yoga & dance
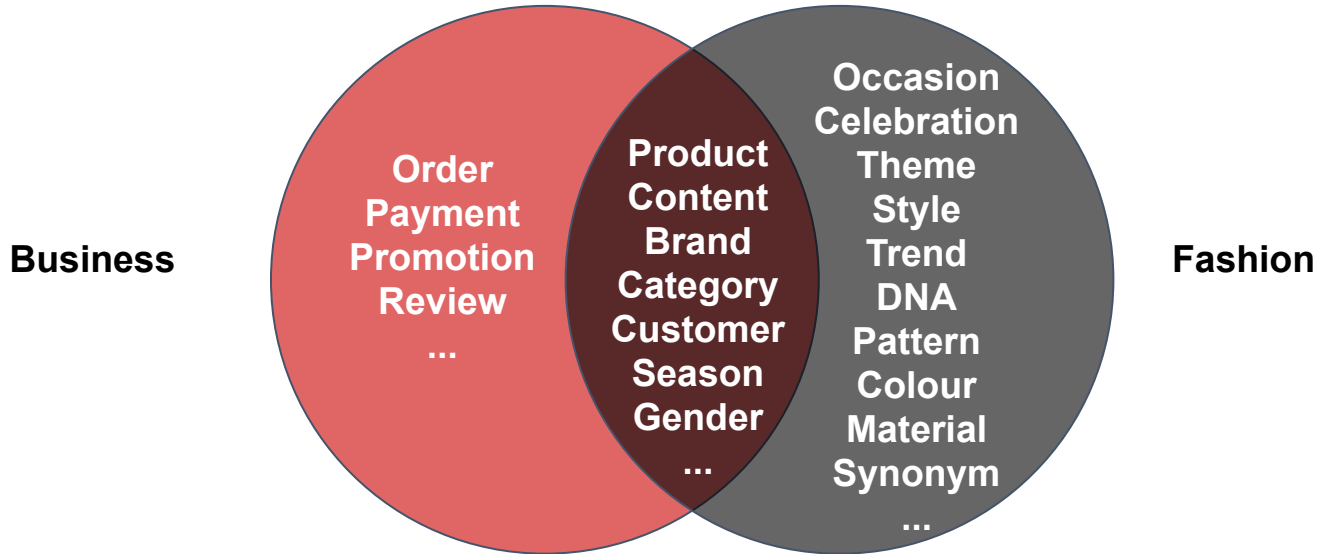
Spotlight On

COATS

Shop Now

Where Business Meets Fashion
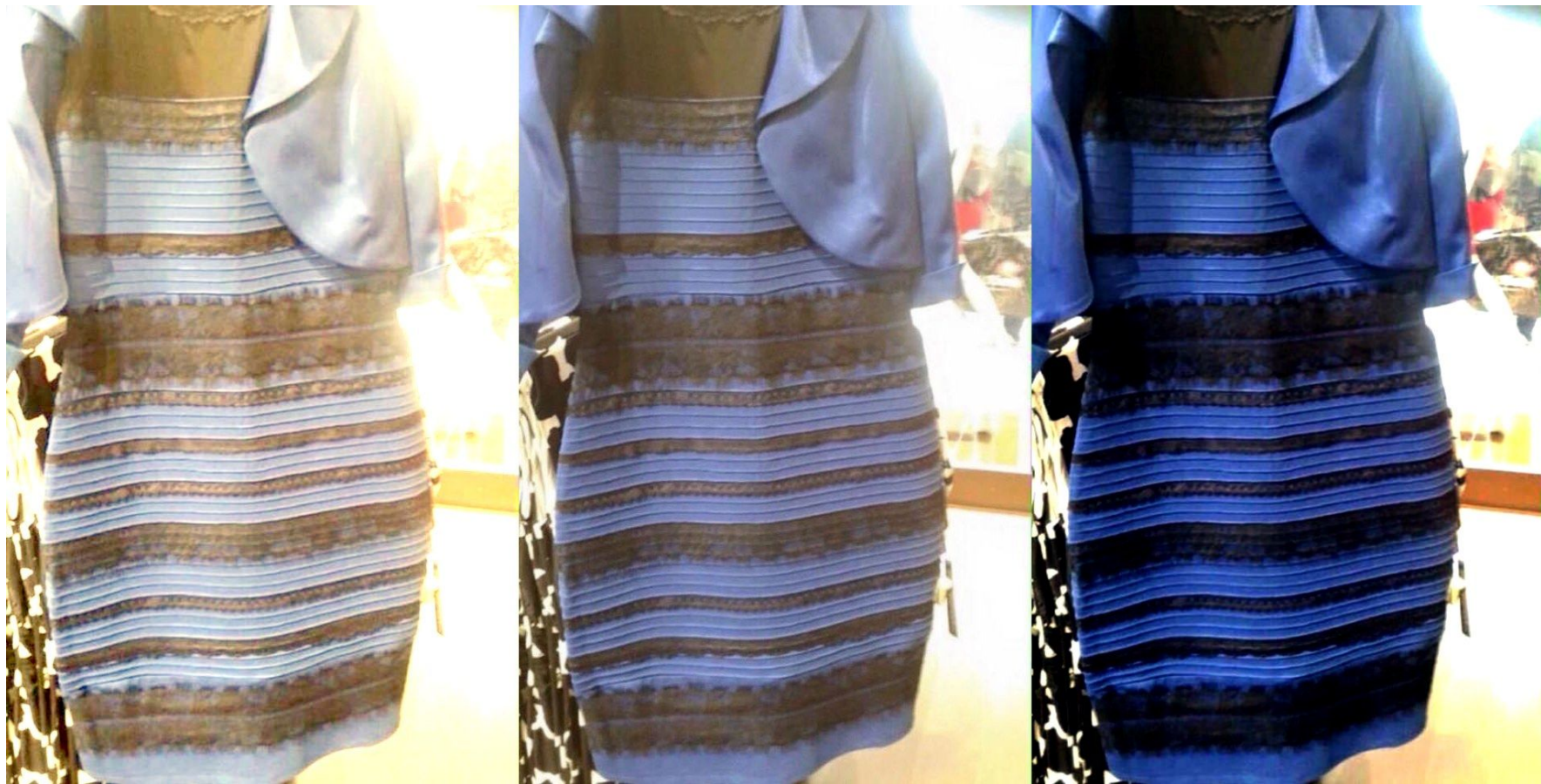
A domain specific knowledge graph for fashion.

Business vs Fashion Entities

Business

Fashion

Order
Payment
Promotion
Review
...

Product
Content
Brand
Category
Customer
Season
Gender
...

Occasion
Celebration
Theme
Style
Trend
DNA
Pattern
Colour
Material
Synonym
...

How many ways can you say "puffer jacket"?

Padded jacket

Padded coat

Down coat

Puffer coat

Down jacket

Down-filled coat

Quilted coat

Puffer jacket

Down-filled jacket

Quilted jacket

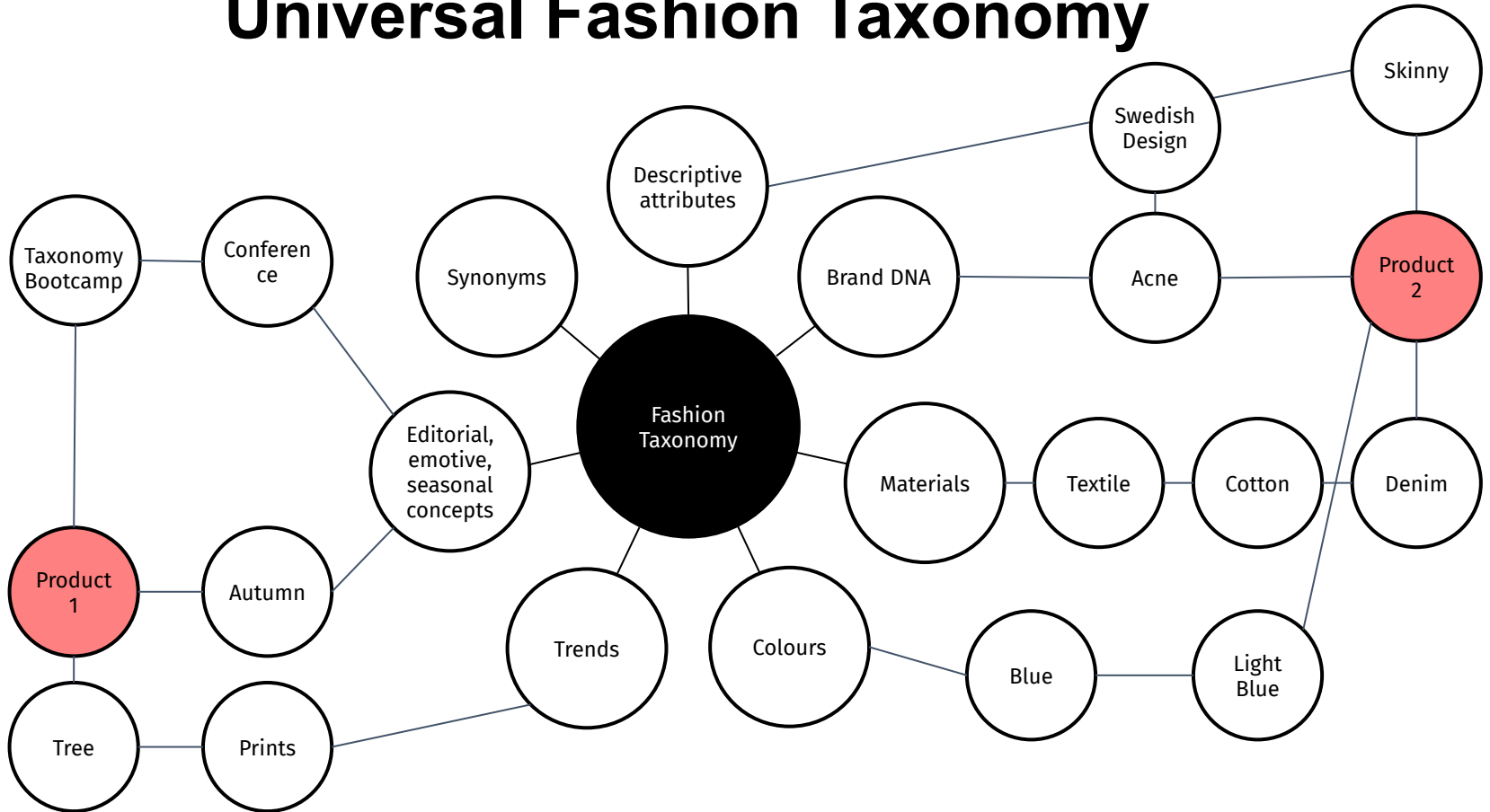Duvet jacket

Duvet coat

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Perception

Subjectivity

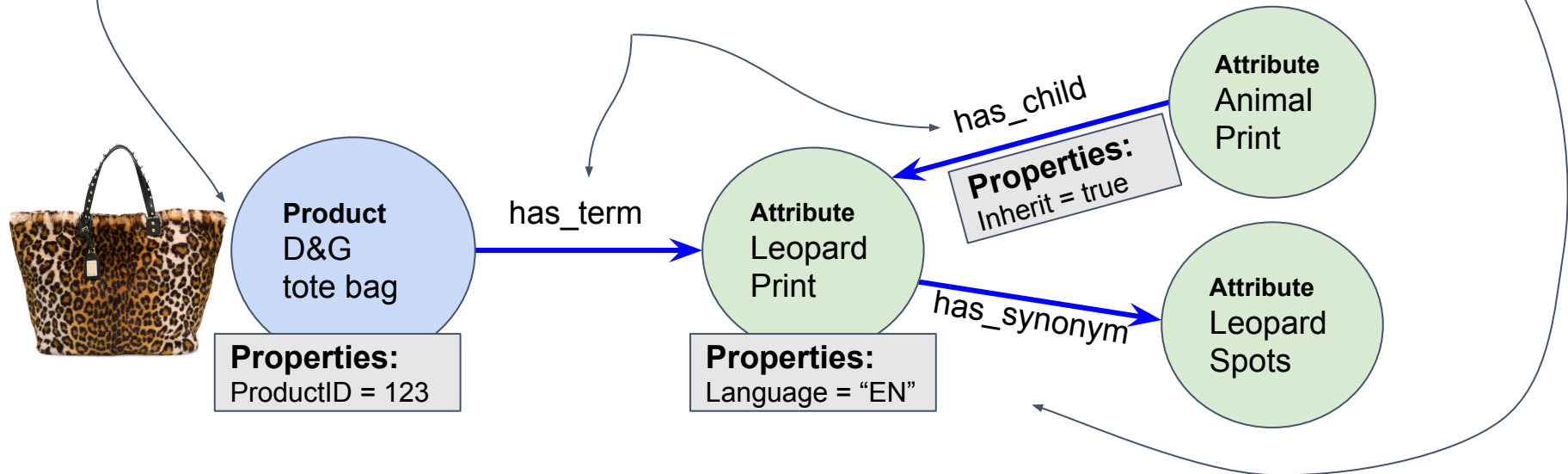# Universal Fashion Taxonomy

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Associating entities in a Knowledge Graph

What is a knowledge graph?
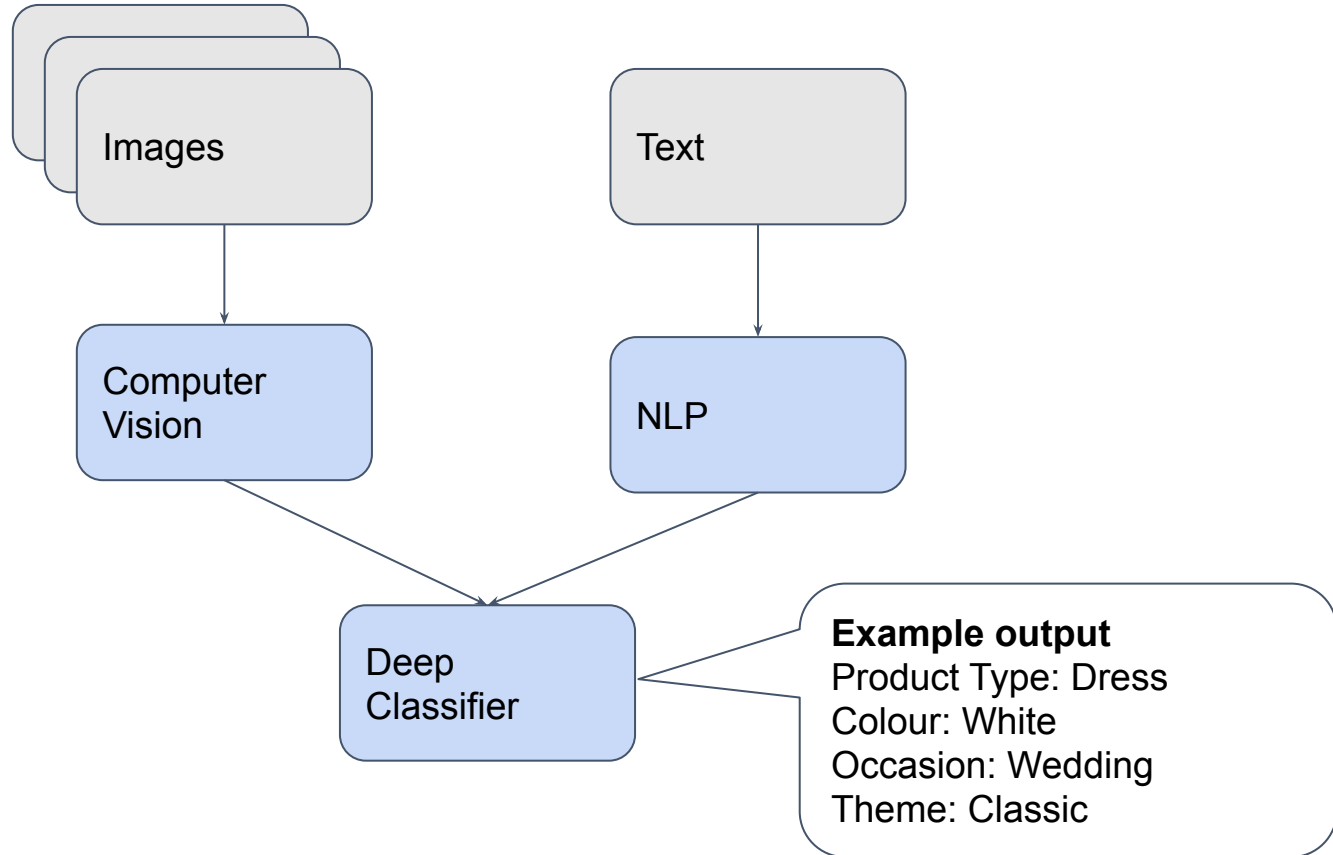
A **knowledge graph** can describe

- a collection of **nodes** (entities) representing business and fashion entities

- each containing information (**properties**)

- and with labeled **relationships** between the nodes

Product
D&G
tote bag

Properties:
ProductID = 123

has_term

has_child

Attribute
Animal
Print

Properties:
Inherit = true

Attribute
Leopard
Print

Properties:
Language = "EN"

has_synonym

Attribute
Leopard
Spots

Dots and Lines

AI: A Multi-Modal Multi-Task Approach

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Building a fashion knowledge graph

Applications

| Search | Recommendations | ... |

Fashion Knowledge Graph
Associates fashion entities with business entities

Taxonomy & Graph Construction

| AI | Knowledge cleaning | Entity resolution | Schema mapping |

Knowledge Collection

| Expert Knowledge | Data-Driven Insights |

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What did we learn?

☑ **Collaborate early with SMEs**

☑ **Incorporate data-driven insights**

☑ **Invest in defining a unified taxonomy/graph and share it**

☑ **Consider perspective: seller vs consumer facing metadata**

☑ **Use and promote standards where possible**

Application to Search

Use of Taxonomies/Knowledge Graphs in Search

- They help us to understand the domain vocabulary and its structure

biker jacket

New Season
BALMAIN
shearling leather biker jacket

New Season
SAINT LAURENT
off-centre zipped leather jacket

New Season
BOSS HUGO BOSS
mock neck jacket

New Season
JUST CAVALLI
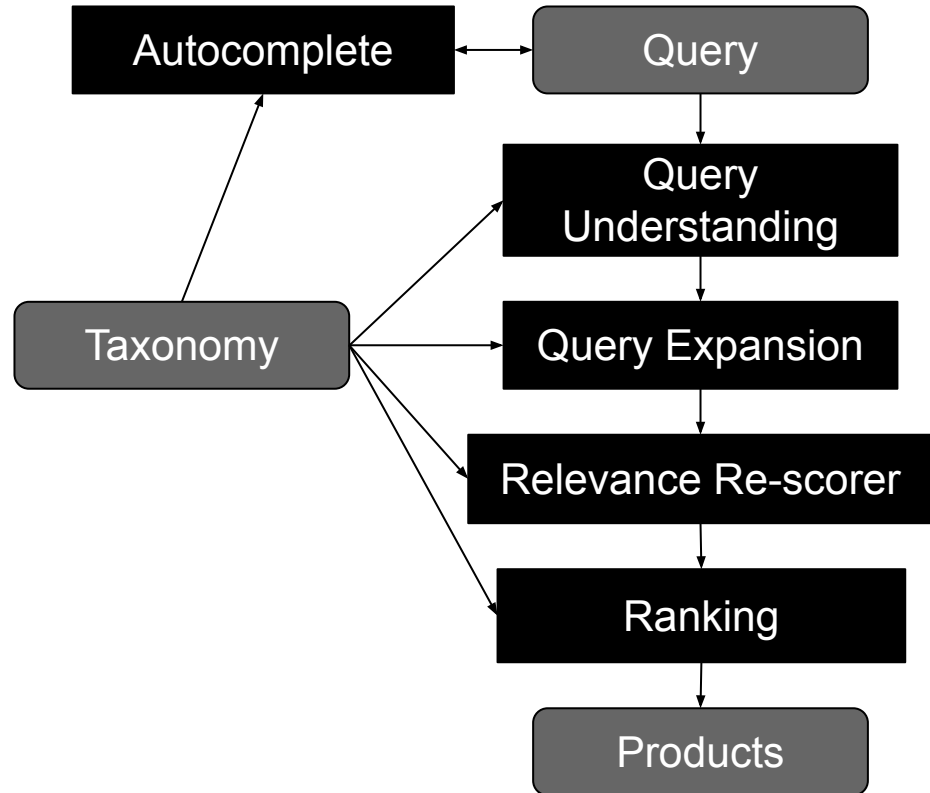sheepskin aviator jacket
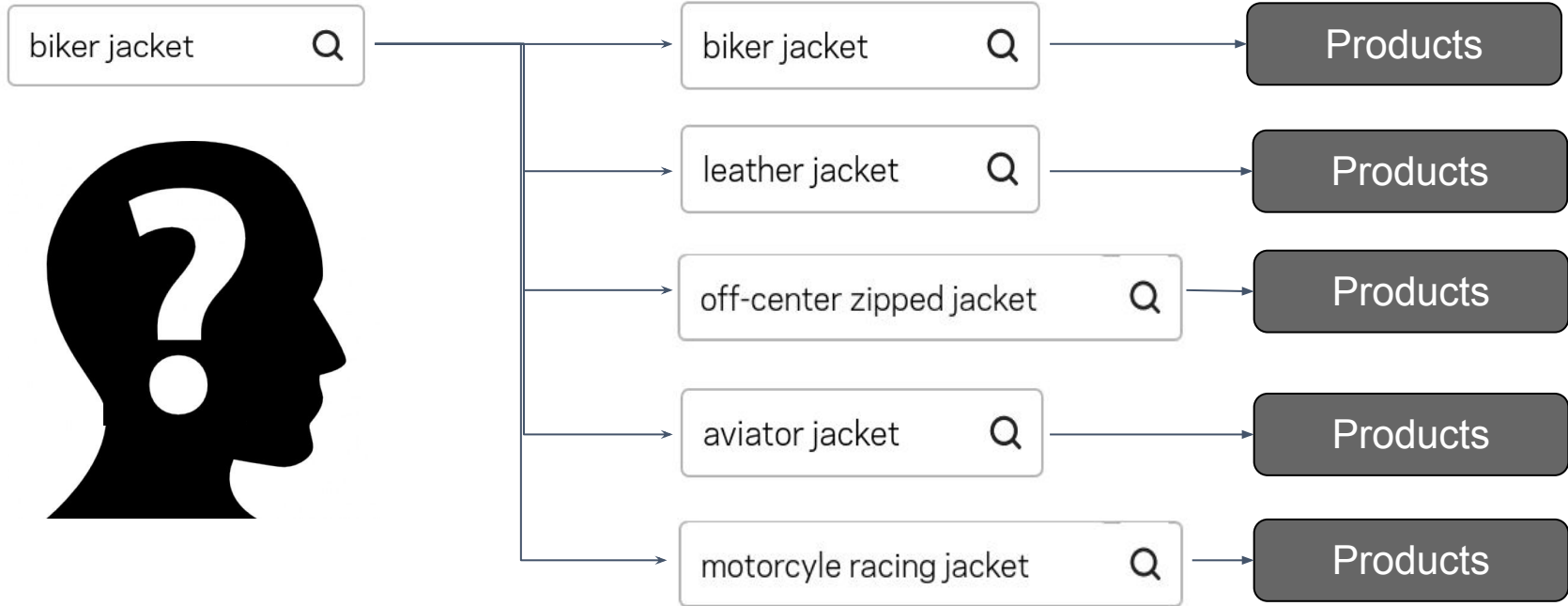
New Season
VERSACE
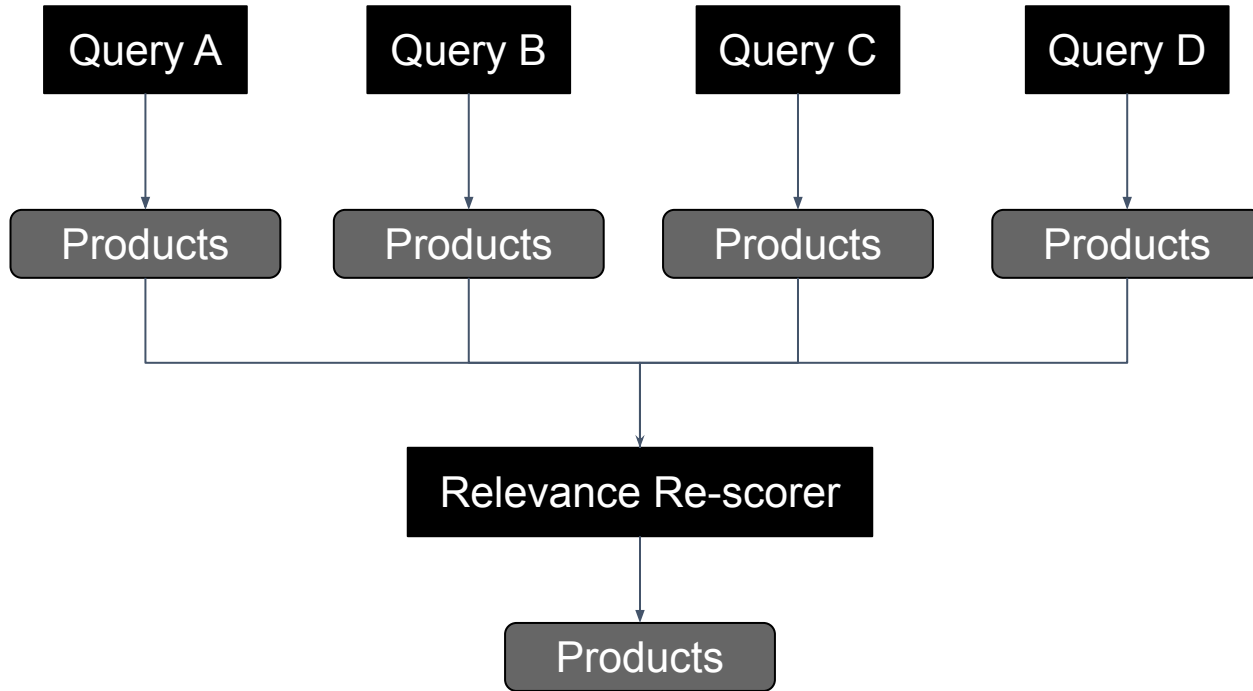X Ford race logo biker jacket

How modern architectures of Search work

- Autocomplete

- Query Understanding

- **Query Expansion**

- Relevance Re-scorer

- Ranking

Query Expansion

biker jacket 🔍 → biker jacket 🔍 → Products

leather jacket 🔍 → Products

off-center zipped jacket 🔍 → Products

aviator jacket 🔍 → Products

motorcyle racing jacket 🔍 → Products

How to mix different set of products?

How to score different expansions?

- Each expansion gives a score for each product

- Combined score is a parameterized model

- Parameters may be trained using click logs and machine learning

- The threshold cut could also be learned

$$y = \lambda 1 \; \boxed{A} + \lambda 2 \; \boxed{B} + \lambda 3 \; \boxed{C} + \lambda 4 \; \boxed{D}$$

FARFETCH

biker jacket

Shop consciously on Farfetch. Explore now

DESIGNER JACKETS FOR MEN

Complete the look with our designer jackets. We've got styles from all your favorite brands including Burberry, Gucci and Ralph Lauren. Moncler's padded jackets will keep you warm whilst Stone Island and Off-White jackets channel a streetwear vibe.

100+ pieces

Biker Jackets ✕

Sort by ⌄

Category ⌄

Designer ⌄

Size ⌄

Occasion ⌄

Colour ⌄

Price ⌄

90 Minutes Delivery To ⌄

Same Day Delivery To ⌄

Positively Farfetch ⌄

New Season

BALMAIN
shearling leather biker jacket
£3,375

New Season

VERSACE
X Ford race logo biker jacket
£4,660

Permanent Collection

GUCCI
guccy japanese acetate biker jacket
£2,950

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Questions

@GeorgeCushen

@PedroBalage

#Farfetch

We're hiring!