Improving search experience with a taxonomy in the fashion domain

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Taxonomy Boot Camp 2019
Farfetch at a glance

- $1.4 Billion* Gross Merchandise Value
- > 3,000* Employees across 13 countries
- $601** AOV on Marketplace
- > 1,000** Luxury sellers on the Marketplace
- > 1.7 million** Active Marketplace consumers
- > 2.9 Million* Orders on Marketplace
- > 3,000* Brands available for consumers to shop
- > 3,000* Marketplace language sites
- $307 Billion Size of personal luxury good industry (Bain estimates)

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

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

🔍 Applying the taxonomy and graph to improve the search experience

Data Science

Knowledge Graph
Where Business Meets Fashion

A domain specific knowledge graph for fashion.

Business vs Fashion Entities

- Business
  - Order
  - Payment
  - Promotion
  - Review

- Fashion
  - Occasion
  - Celebration
  - Theme
  - Style
  - Trend
  - DNA
  - Pattern
  - Colour
  - Material
  - Synonym

Product
- Content
- Brand
- Category
- Customer
- Season
- Gender

...
How many ways can you say “puffer jacket”? 

Puffer jacket
Padded jacket
Down coat
Down jacket
Quilted coat
Duvet coat
Down-filled jacket
Duvet jacket
Puffer coat
Padded coat
Down-filled coat
Perception
Subjectivity
Universal Fashion Taxonomy

- Synonyms
- Descriptive attributes
- Brand DNA
- Materials
- Textile
- Cotton
- Denim
- Swedish Design
- Acne
- Product 2
- Product 1
  - Tree
  - Prints
- Editorial, emotive, seasonal concepts
- Trends
- Colours
- Blue
- Light Blue
- Autumn
- Conference
- Taxonomy Bootcamp
- Skinny
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
Dots and Lines
AI: A Multi-Modal Multi-Task Approach

Images

Computer Vision

Text

NLP

Deep Classifier

Example output
Product Type: Dress
Colour: White
Occasion: Wedding
Theme: Classic
Building a fashion knowledge graph

Applications

- Search
- Recommendations
- ...

Taxonomy & Graph Construction

- AI
- Knowledge cleaning
- Entity resolution
- Schema mapping

Knowledge Collection

- Expert Knowledge
- Data-Driven Insights
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
How modern architectures of Search work

- Autocomplete
- Query Understanding
- Query Expansion
- Relevance Re-scorer
- Ranking
Query Expansion

- biker jacket
- leather jacket
- off-center zipped jacket
- aviator jacket
- motorcycle racing jacket

Products

Products

Products

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

\[ y = \lambda_1 A + \lambda_2 B + \lambda_3 C + \lambda_4 D \]
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.
Questions

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#Farfetch

We’re hiring!