



# The Digital Transformation for Argos Search and Browse

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*Argos*

01/03/2017

# ABOUT ME

UNIVERSITY OF  
**Southampton**

Aeronautics &  
Astronautics

Computational  
Engineering  
Design MEng

Complex  
Systems  
Simulation  
PhD

Software  
Development  
Engineer





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BUILDING THE FUTURE OF  
RETAIL

# ARGOS

800+  
STORES

29m  
STORE  
CUSTOMERS

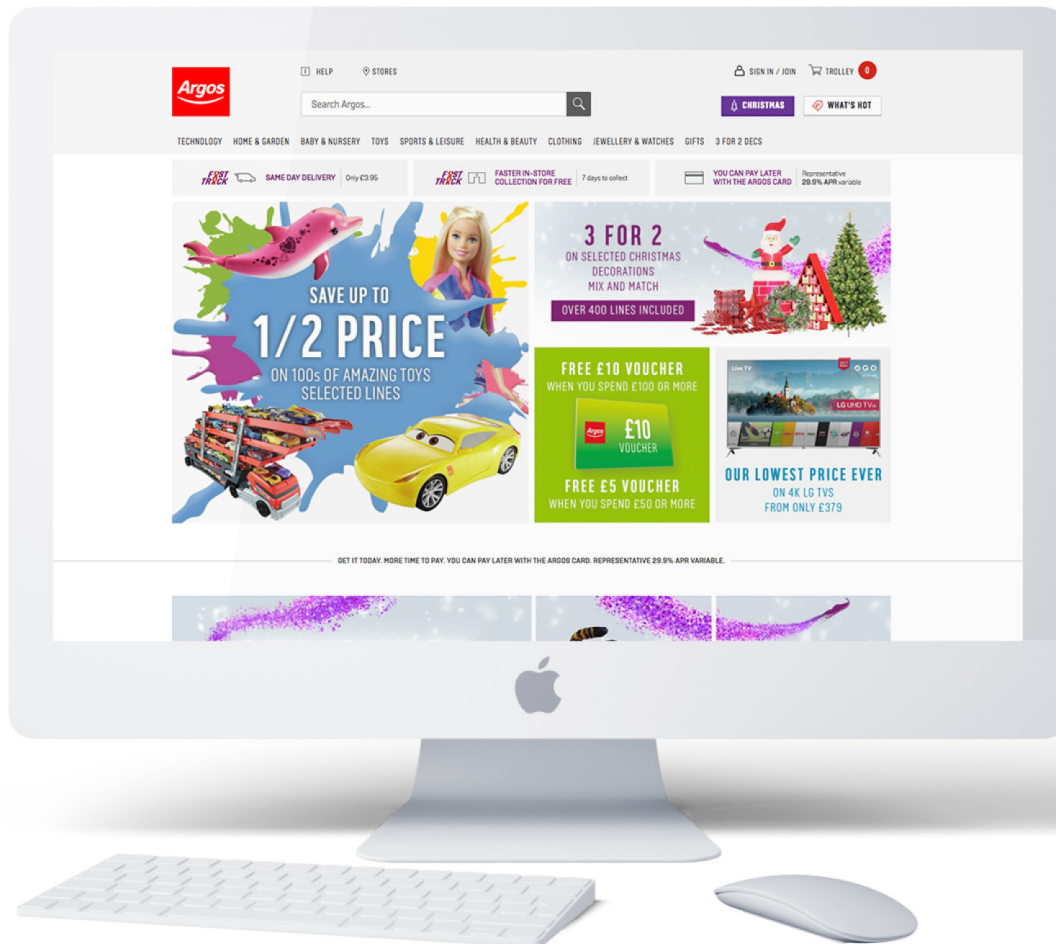
1bn  
ONLINE  
VISITS

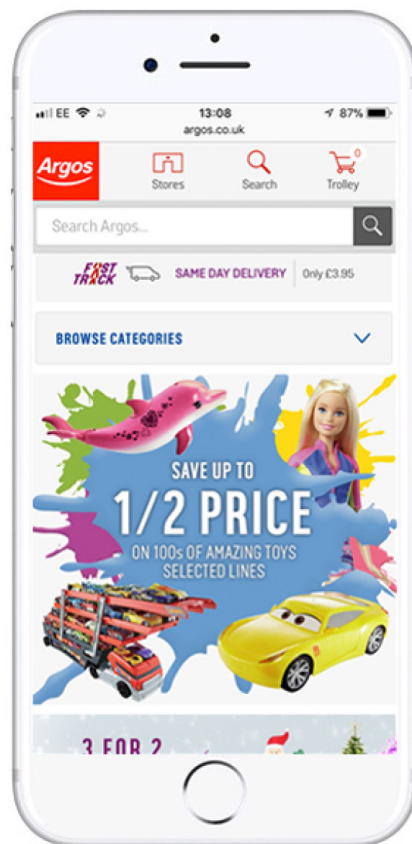
60,000  
PRODUCTS

#1 UK  
MULTI-CHANNEL  
RETAILER











1 hour  
800,000 VISITORS

13,000  
CUSTOMERS  
PER MINUTE



84%  
MOBILE

2m  
VISITS IN  
4 HOURS

# EXAMPLE PROCESS



# BUILD

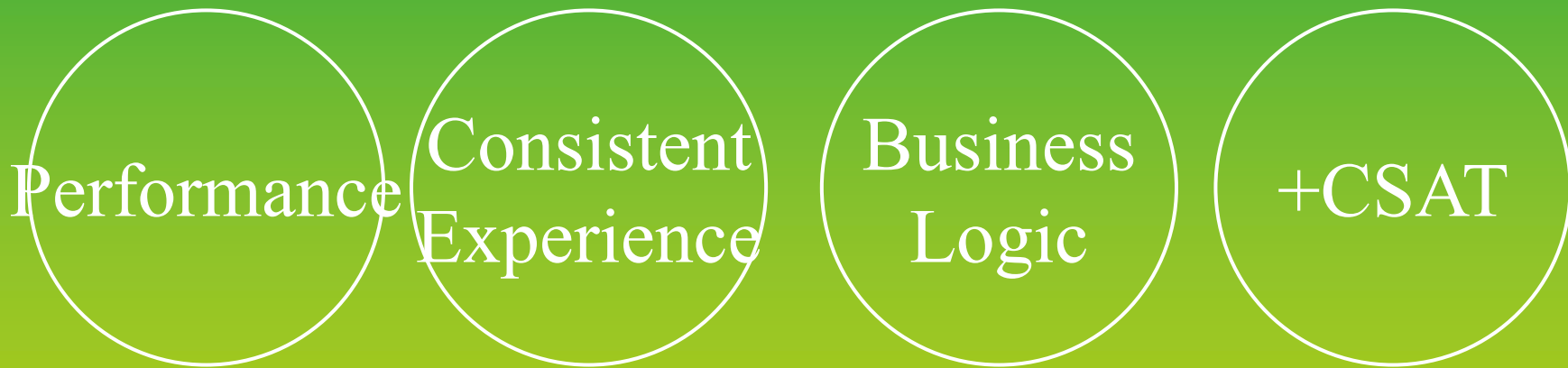
---

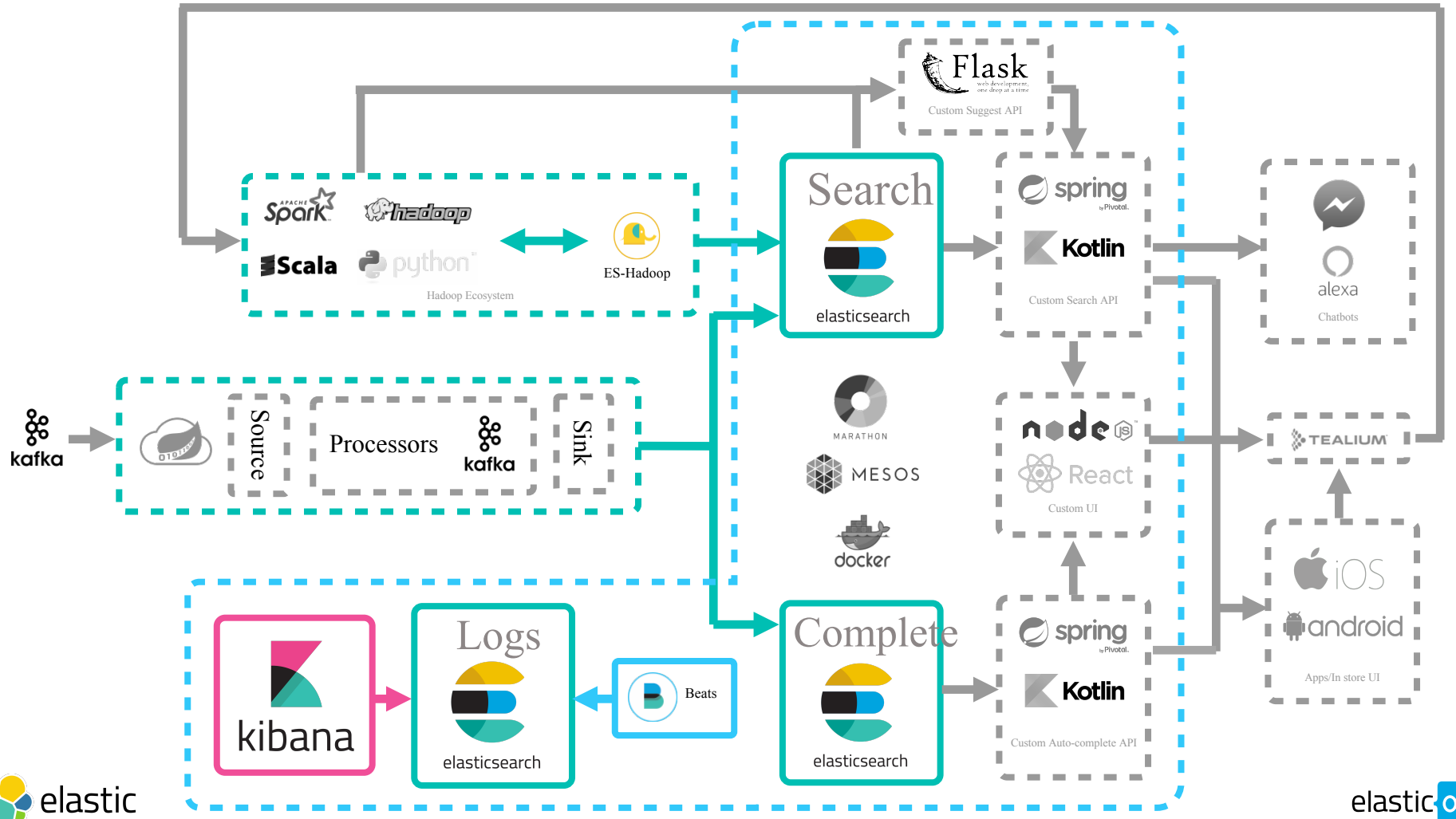
BUILDING THE FUTURE  
OF RETAIL

# NOT BUY



# CHALLENGE







# Features

Product  
Variations

Category &  
Attribute  
Matching

Did You  
Mean

Autocomplete


Customer  
Insights

Availability

Logging

# Product Variations - Experience

## Colour Ambiguity




HOME Newton Solid Wood Table and 6 Mid Back Chairs

★★★★☆ (29)

**£379.99**

[CHOOSE OPTIONS](#)



Collection Stonebury Extendable Oak Veneer Table & 4 Chairs

★★★★★ (29)

FROM **£279.99**

[CHOOSE OPTIONS](#)


## Filtered by Colour

**COLOUR GROUP**

Clear

- ☐ Grey (120)
- ☐ Black (117)
- ☐ Cream (83)
- ☐ Brown (74)
- ☐ Natural (51)
- ☐ White (44)
- ☒ Blue (30)
- ☐ Two Tone (18)
- ☐ Oak (16)
- ☐ Multicoloured (6)
- ☐ Champagne (3)
- ☐ Dark Wood (2)
- ☐ Pine (2)
- ☐ Red (1)
- ☐ Whites (1)

[Show less](#)




HOME Elmwood Oak Veneer Ext Table & 6 Chairs - Duck Egg

★★★★★ (5)

**£529.99**

[ADD TO TROLLEY](#)




Collection Swanbourne Ext Oak Vnr Table & 4 Chairs -Duck Egg

★★★★★ (16)

**£439.99**

[ADD TO TROLLEY](#)

## Search by Colour




HOME Elmwood Oak Veneer Ext Table & 6 Chairs - Duck Egg

★★★★★ (5)

**£529.99**

[CHOOSE OPTIONS](#)



Collection Swanbourne Ext Oak Vnr Table & 4 Chairs -Duck Egg

★★★★★ (16)

**£439.99**

[CHOOSE OPTIONS](#)


Search: “dining sets”

**COLOUR GROUP**

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- ☐ Grey (120)
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- ☐ Natural (51)
- ☐ White (44)
- ☒ Blue (30)
- ☐ Two Tone (18)
- ☐ Oak (16)
- ☐ Multicoloured (6)
- ☐ Champagne (3)
- ☐ Dark Wood (2)
- ☐ Pine (2)
- ☐ Red (1)
- ☐ Whites (1)

[Show less](#)



Collection Stonebury Extendable Oak Veneer Table & 4 Chairs

★★★★★ (29)

FROM **£279.99**

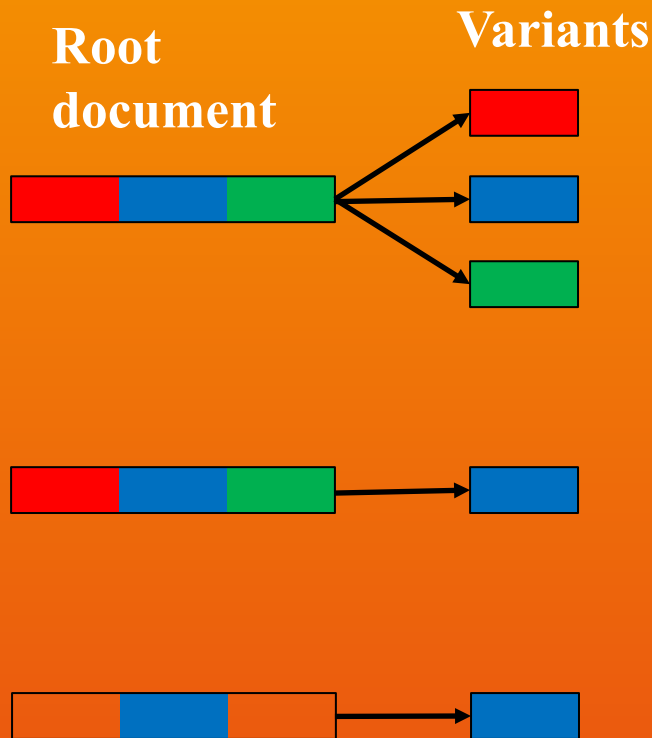
[CHOOSE OPTIONS](#)

Search: “blue dining sets”

# Product Variations

```
curl -XGET localhost:9200/product/123456
```

```
{
  ...,
  "_source" : {
    "id": "123456",
    "name": "This is a parent product",
    "variants": [
      {
        "id": "123456",
        "name": "This is an item",
        "attributes": [...]
      },
      {
        "id": "123457",
        "name": "This is another item",
        "attributes": [...]
      }
    ]
  },
  "categories": [...],
  "attributes": [...]
}
```



# Product Variations – Filtering &

Search

```
curl -XPOST localhost:9200/product/_search -d
```

```
{
  "filter": {
    "bool": {
      "must": [
        "bool": {
          "should": [...]
        },
        "bool": {
          "should": [...]
        }
      ]
    }
  }
}
```

```
curl -XPOST localhost:9200/product/_search -d
```

```
{
  "constant_score": {
    "filter": {...}
  },
  "bool": {
    "should": [
      "match": {
        "definingAttribute": "blue"
      }
    ]
  }
}
```

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- ☐ Whites (1)

[Show less](#)



HOME Elmwood Oak Veneer Ext Table  
& 6 Chairs - Duck Egg

★★★★★ (5)

£529.99

[ADD TO TROLLEY](#)



Collection Swanbourne Ext Oak Vnr  
Table & 4 Chairs -Duck Egg

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[Show less](#)



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[CHOOSE OPTIONS](#)



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Table & 4 Chairs -Duck Egg

★★★★★ (16)

£439.99

[CHOOSE OPTIONS](#)

# Product Variations - Aggregations

```
curl -XPOST localhost:9200/product/_search -d '{
  ...,
  "aggs": {
    "filter": {...},
    "aggs": {
      "nested": { "path": "variants" },
      "aggs": {
        "filter": {...},
        "aggs": {
          "reverse_nested": {},
          "aggs": {
            "terms": {...}
          }
        }
      }
    }
  }
}'
```

OR  
Plugin

[extends](#) AbstractSearchScript

# Features

Product  
Variations

Category &  
Attribute  
Matching

Did You  
Mean

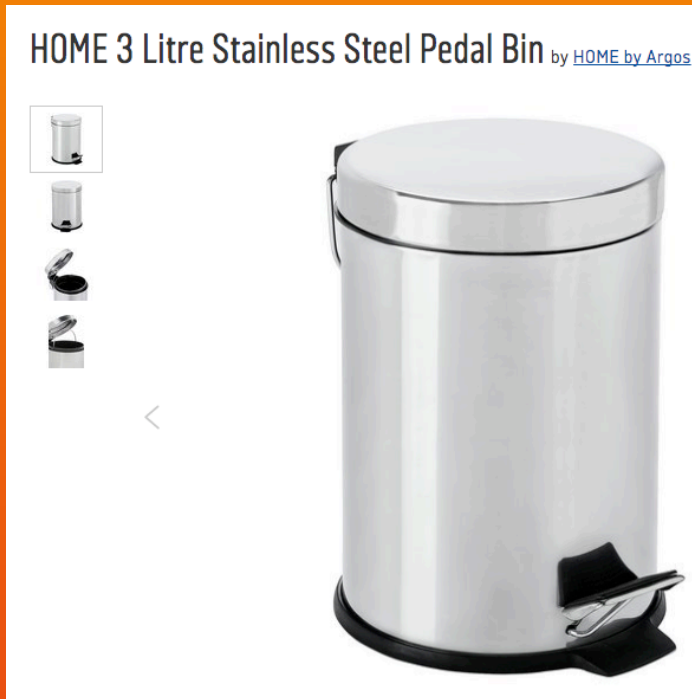
Autocomplete

Customer  
Insights

Availability

Logging

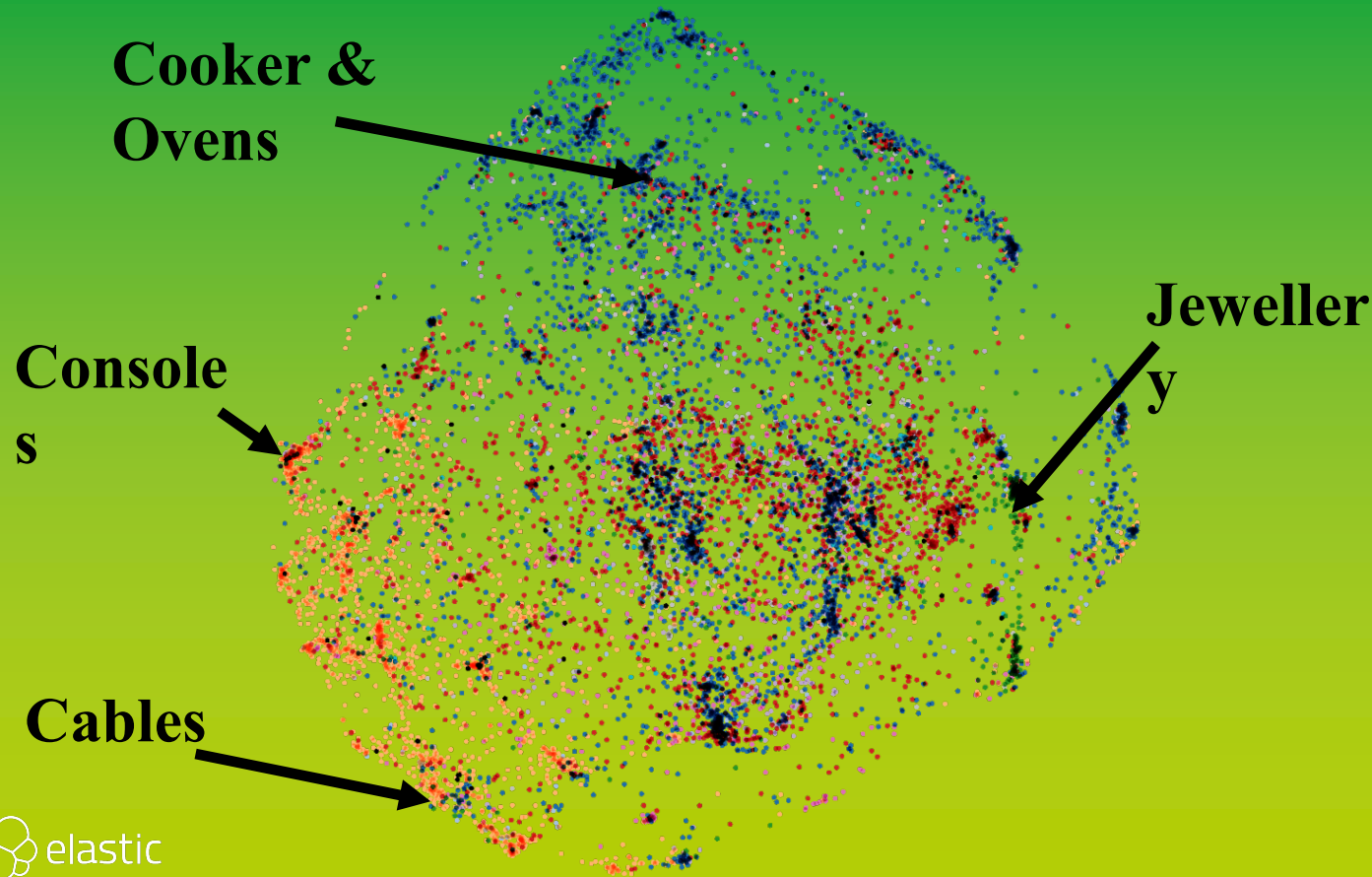
# How do users search?



```
chrome pedal bin
grey pedal bin
semi round pedal bin
retro pedal bin
mini pedal bin
classic pedal bin
square pedal bin
cream kitchen pedal bin
pedal bin stainless
pedal bin toilet brush
pedal bin 50
pedal bin 50 l
pedal bin blue
pedal bin copper
pedal bin 20 litre
pedal bin 12 litre
purple pedal bin
bathroom pedal bin stainless
bathroom pedal bin stainless steel
```

# Content Based

# Query Mining

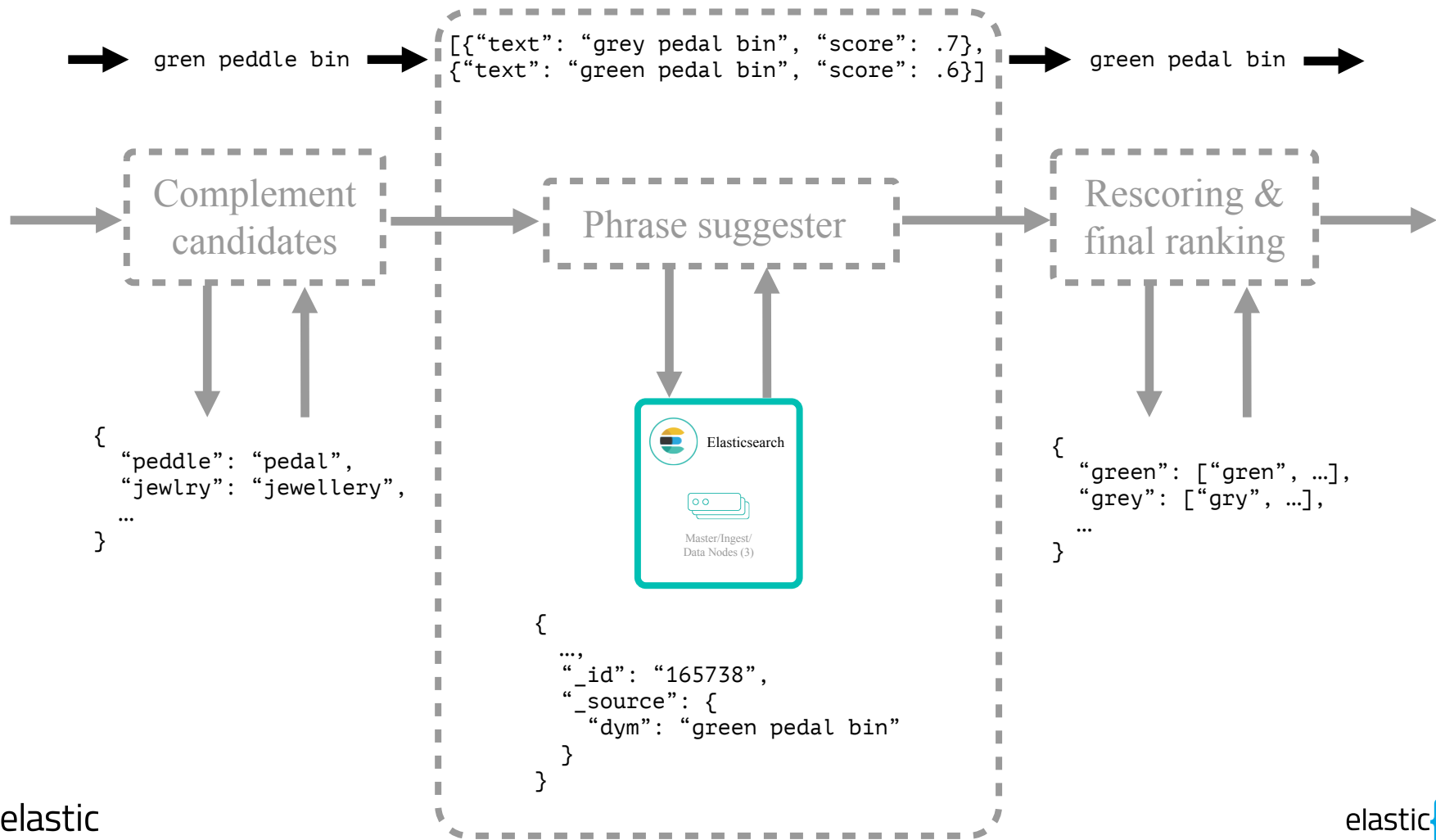


*fast*Text

PYTORCH







# Features

Product  
Variations

Category &  
Attribute  
Matching

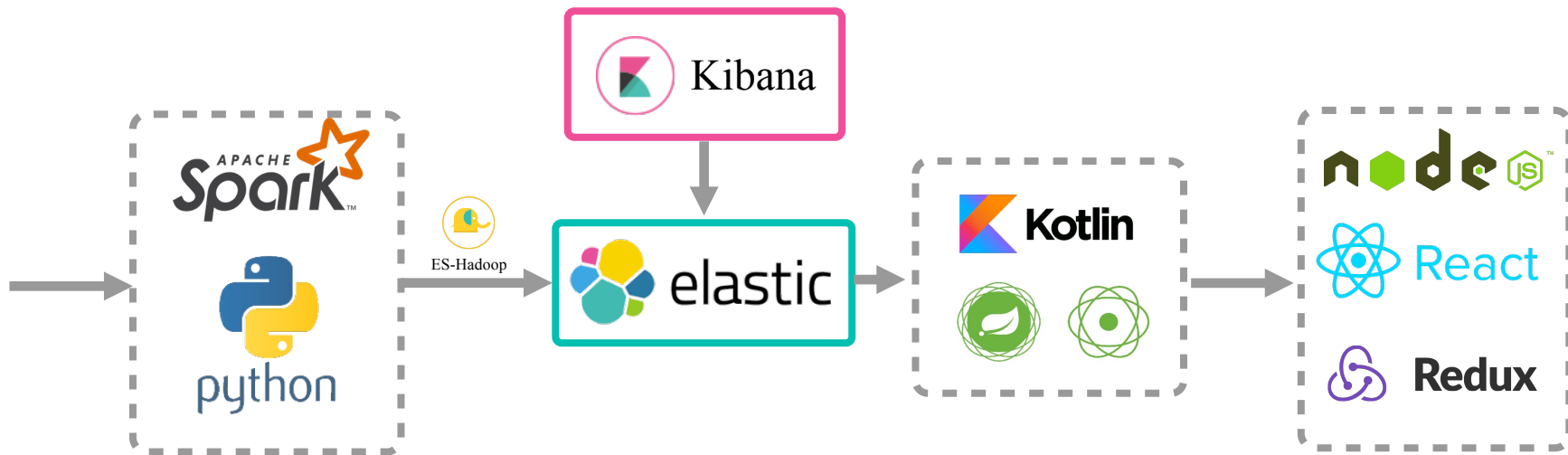
Did You  
Mean

Autocomplete

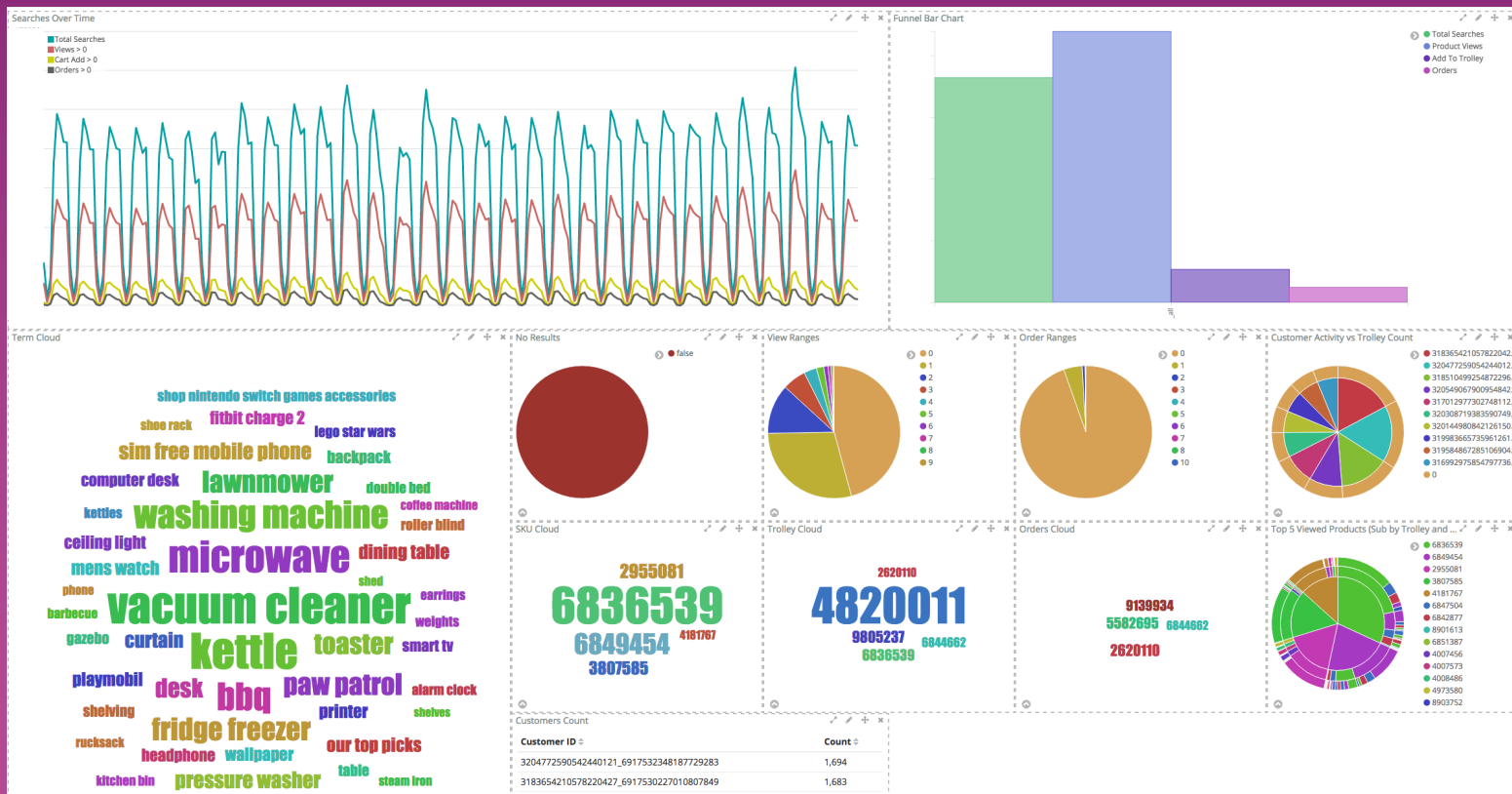
Customer  
Insights

Availability

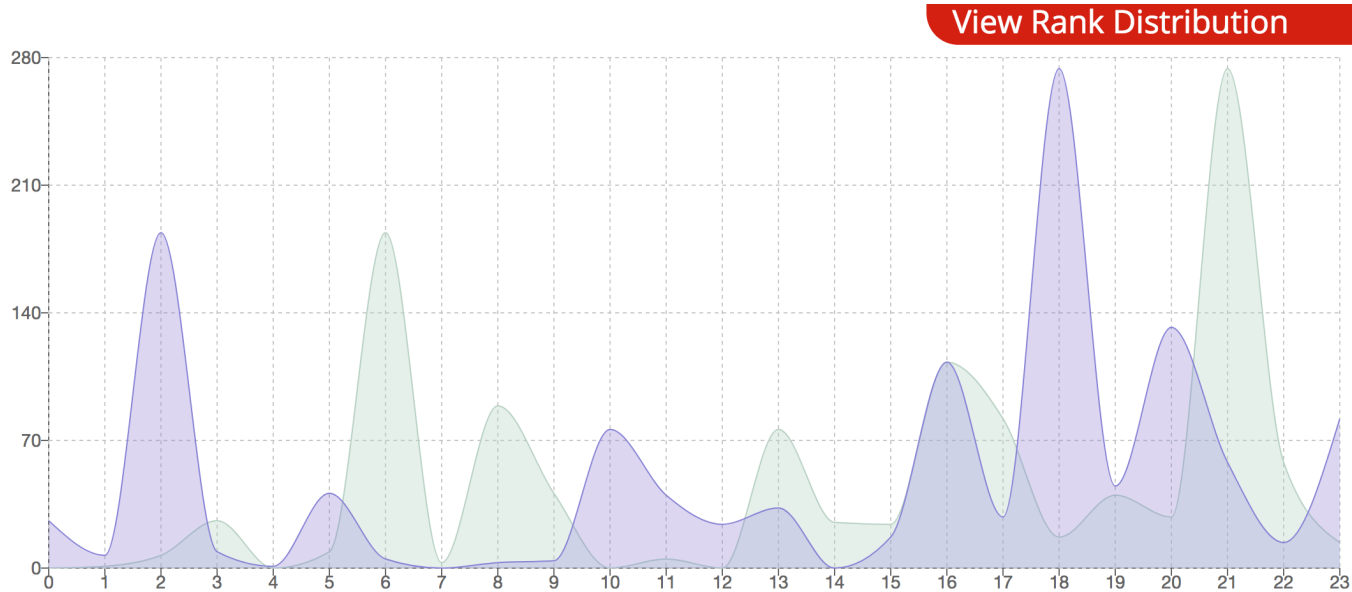
Logging



# Customer Insights



# Relevancy Regression



Add To Trolley Rank Distribution

# Features

Product  
Variations

Category &  
Attribute  
Matching

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Availability

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<http://argos.careers>