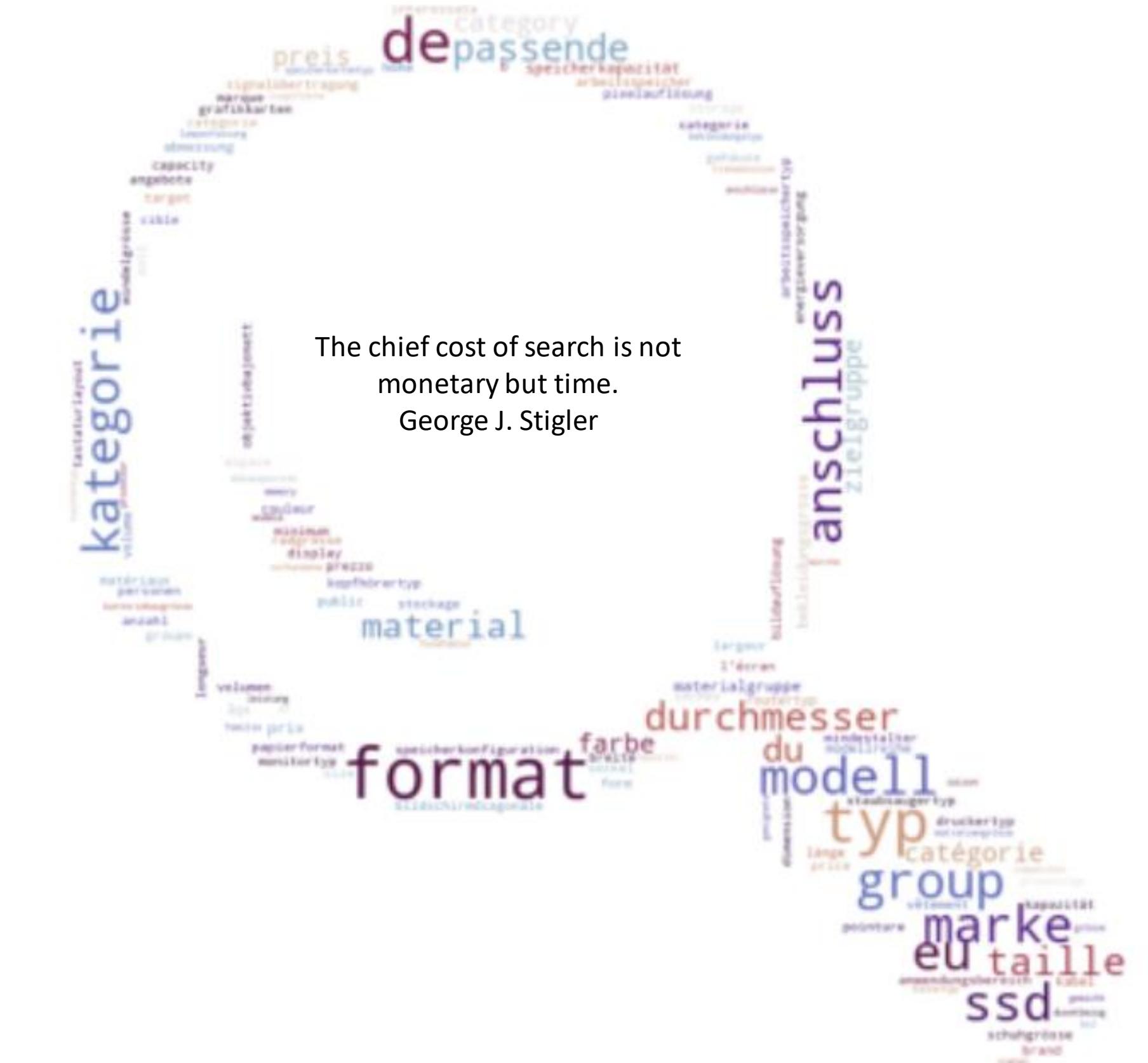


# Leveraging user behavioral data to create effective filter suggestions

Juan Lapadula Plá, Software Engineer  
Joel Widmer, Software Engineer

The chief cost of search is not monetary but time.  
George J. Stigler



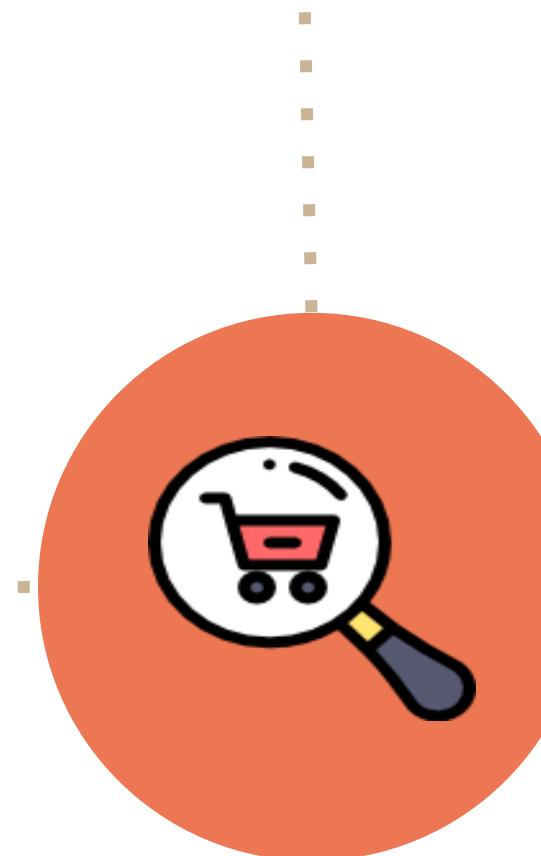
## 7 Countries

Austria, Belgium, Italy,  
France, Germany,  
Netherlands, Switzerland



## 200 Million Searches

in 2022



## CHF 2.4 billion

revenue in 2022



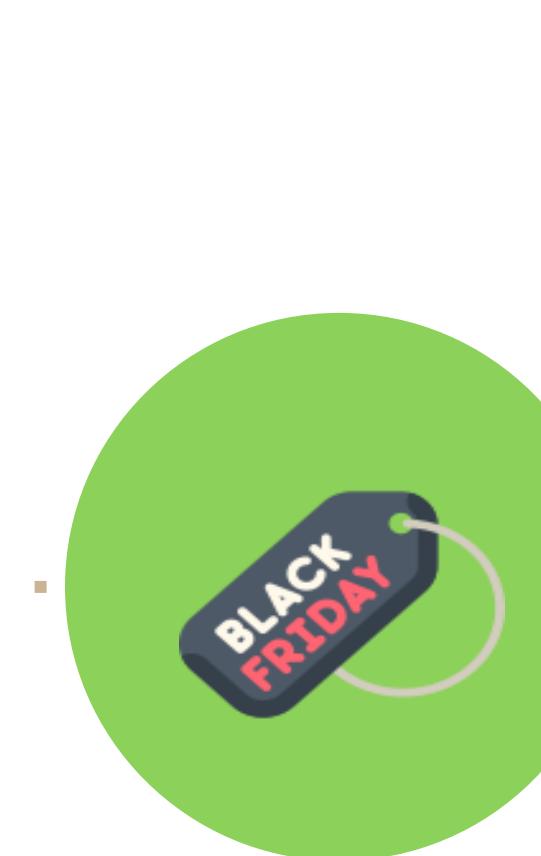
## 5 Languages

Dutch, English, Italian,  
French, German



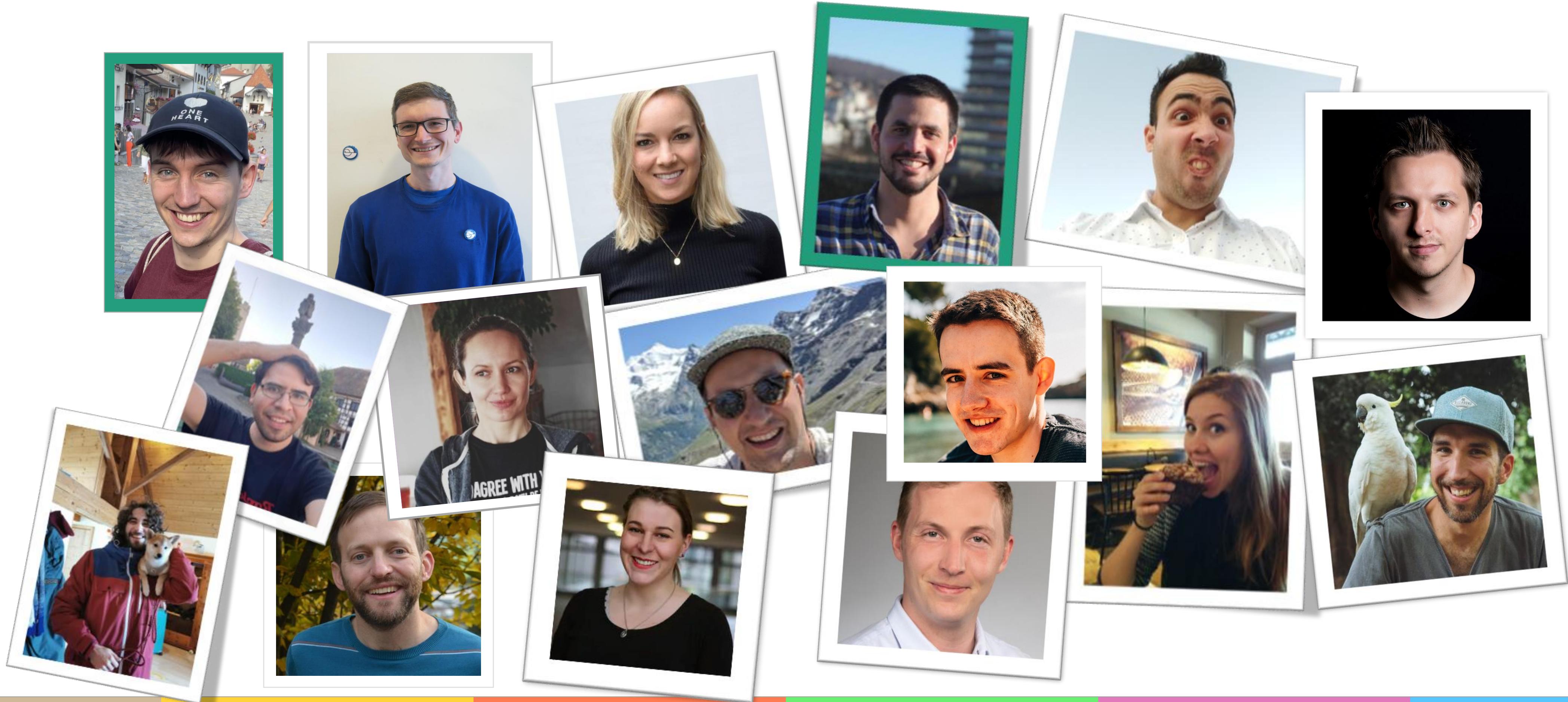
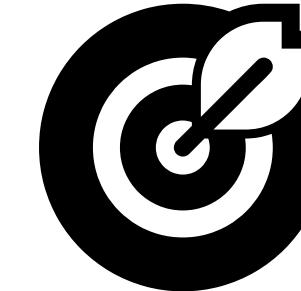
## Over 1 Million Searches

on Black Friday (2022)



Search volume and filter usage is  
calculated for the year 2022

# Two teams, one Mission



# Motivation for filter suggestions

**Results for umbrella**

**3'740 products**

Category ▾ Brand ▾ Price ▾

Offers ▾ Umbrella type ▾ Diameter ▾

Target group ▾ Colour ▾ Material group ▾

Weight ▾ Height ▾ Width ▾

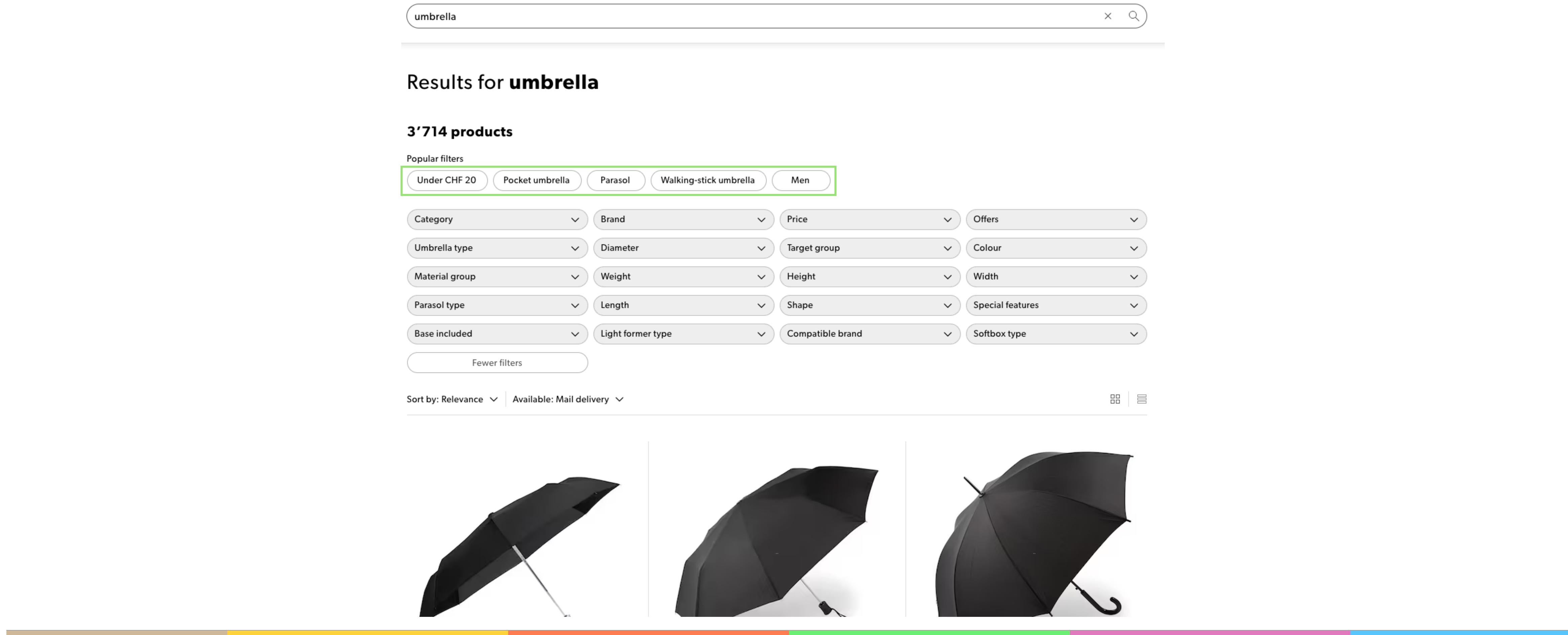
Parasol type ▾ Length ▾ Shape ▾

Special features ▾ Base included ▾ Light former type ▾

Compatible brand ▾ Softbox type ▾ Fewer filters

Under CHF 20 ▾ Pocket umbrella ▾ Parasol ▾ Walking-stick umbrella ▾ Men

# We show up to five Quick filters



umbrella

Results for **umbrella**

**3'714 products**

Popular filters

Under CHF 20 Pocket umbrella Parasol Walking-stick umbrella Men

Category Brand Price Offers  
Umbrella type Diameter Target group Colour  
Material group Weight Height Width  
Parasol type Length Shape Special features  
Base included Light former type Compatible brand Softbox type

Fewer filters

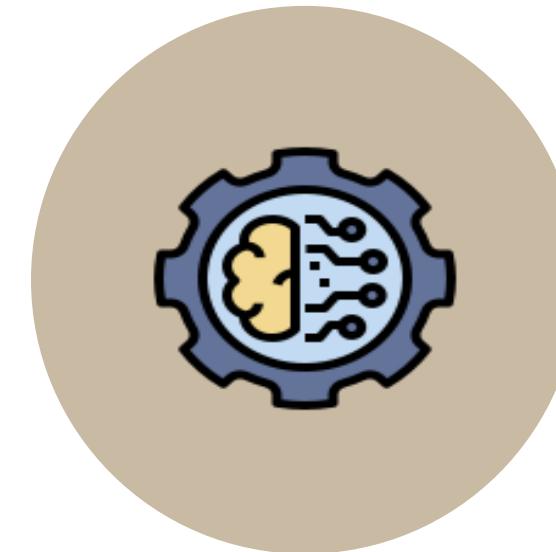
Sort by: Relevance Available: Mail delivery

# The Quick Filters Journey

Evaluation, iteration, and monitoring are essential

## Minimum Viable Product

Leverage behavioral data to create Quick filters



# Minimum viable Quick filters

Calculate relevant filter options using behavioral data

Ergebnisse für pc

Beliebte Filter (Prozessor-Familie)

Most popular options

Core i7 12th Gen Core i7 10th Gen Core i7 11th Gen Core i9 12th Gen Core i9 10th Gen

83'354 Produkte

Kategorie

PC Typ

Arbeitsspeicher

Most popular Filter

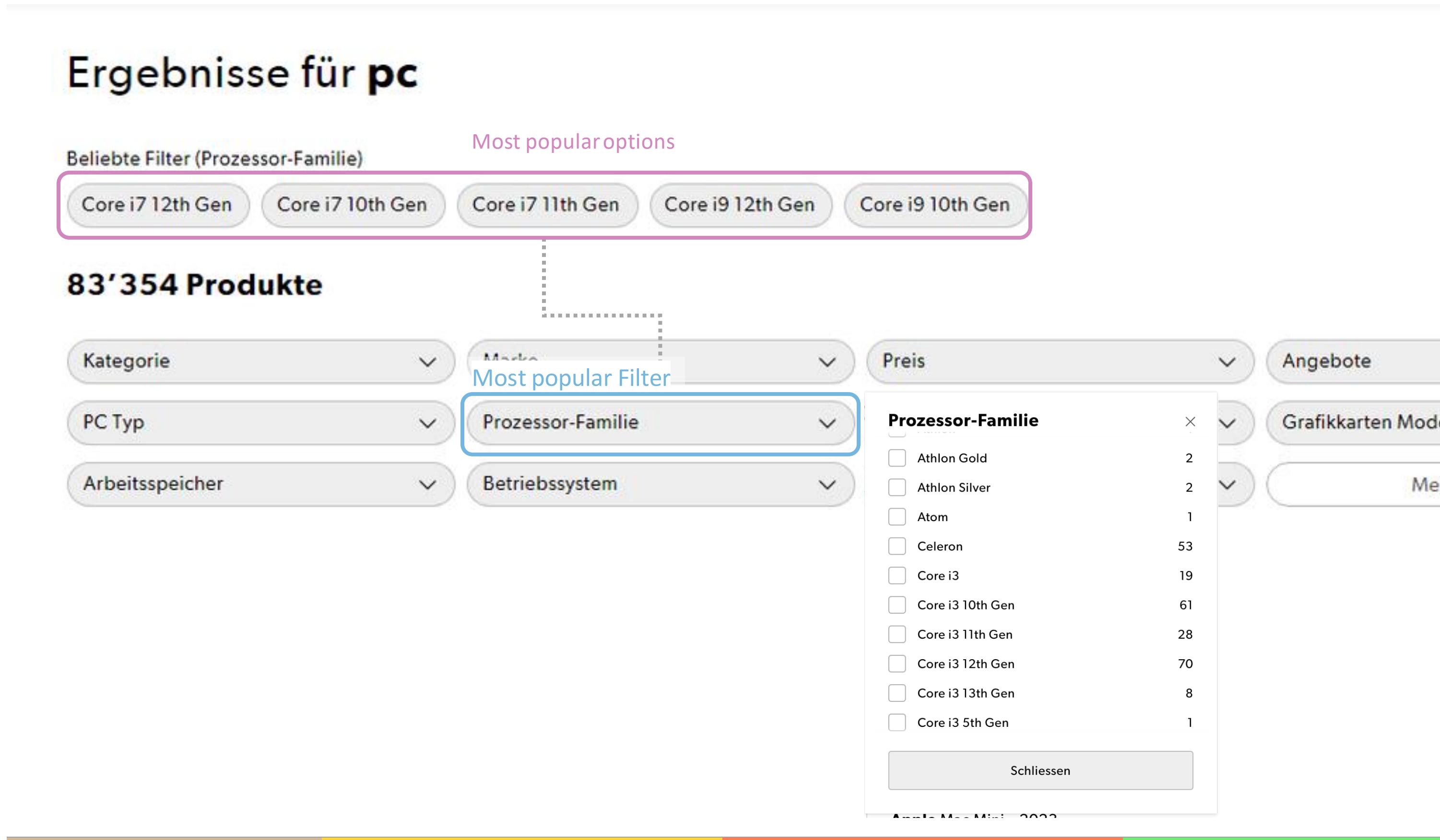
Prozessor-Familie

- Athlon Gold 2
- Athlon Silver 2
- Atom 1
- Celeron 53
- Core i3 19
- Core i3 10th Gen 61
- Core i3 11th Gen 28
- Core i3 12th Gen 70
- Core i3 13th Gen 8
- Core i3 5th Gen 1

Grafikkarten Mode

Mel

Schliessen



The screenshot shows a search interface for 'pc' results. At the top, a bar of 'Most popular options' includes 'Core i7 12th Gen', 'Core i7 10th Gen', 'Core i7 11th Gen', 'Core i9 12th Gen', and 'Core i9 10th Gen'. Below this, a count of '83'354 Produkte' is displayed. The interface includes dropdowns for 'Kategorie', 'PC Typ', 'Arbeitsspeicher', and a 'Most popular Filter' dropdown which is currently set to 'Prozessor-Familie'. A modal window titled 'Prozessor-Familie' lists various processor families with their counts: Athlon Gold (2), Athlon Silver (2), Atom (1), Celeron (53), Core i3 (19), Core i3 10th Gen (61), Core i3 11th Gen (28), Core i3 12th Gen (70), Core i3 13th Gen (8), and Core i3 5th Gen (1). A 'Schliessen' (Close) button is at the bottom of the modal.

Very simple model

- Most popular options from the most popular filter
- Not all types of filters are considered

Quick and dirty

- Hardcoded options
- Simple UI

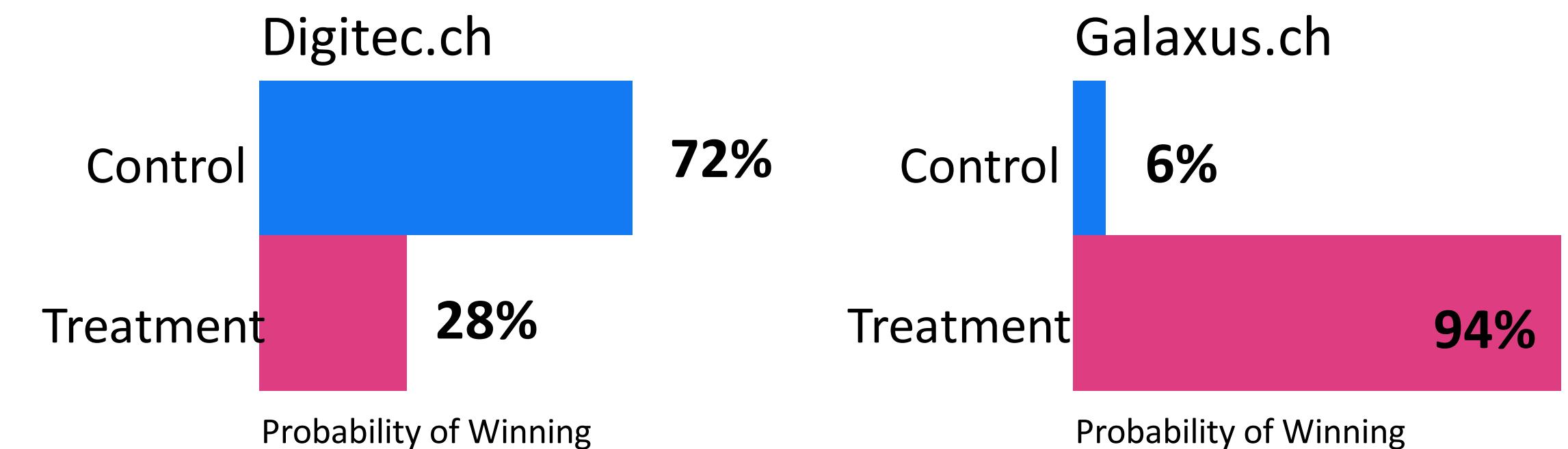
# AB Testing the MVP

Most popular options from the most popular filter

**Drop in the standard filters usage**

Compensated by 7% CTR in the **Quick Filters**

**No clear winner** in Click-through-rate on search results

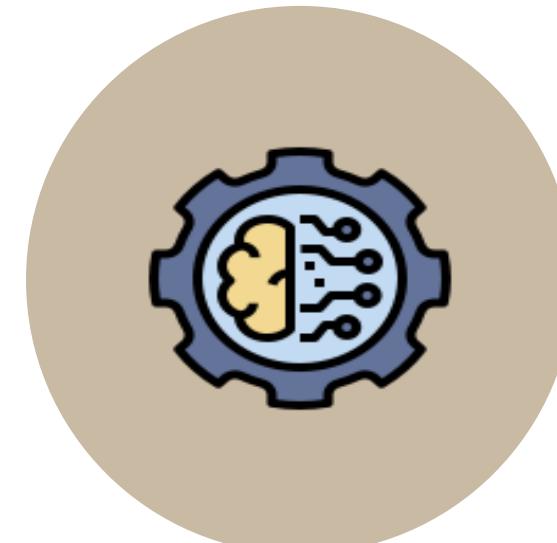


# The Quick Filters Journey

Evaluation, iteration, and monitoring are essential

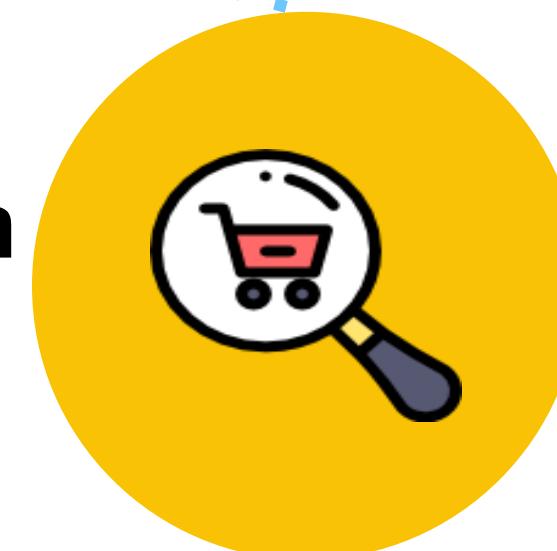
## Minimum Viable Product

Leverage behavioral data to create Quick filters



## Iteratively refine solution

Optimize MVP-Model leveraging A/B test insights



# 2<sup>nd</sup> model - most popular options

Higher quality solution

Ergebnisse für pc

83'888 Produkte

Beliebte Filter

Unter CHF 600 Desktop PC Gaming PC 32 GB ASUS

Kategorie Marke Preis Angebote

PC Typ Prozessor-Familie Prozessortyp Arbeitsspeicher

Kapazität SSD Betriebssystem Version Betriebssystem Mehr

More complex model

- Most popular options (regardless of the filter)

Not so quick and dirty

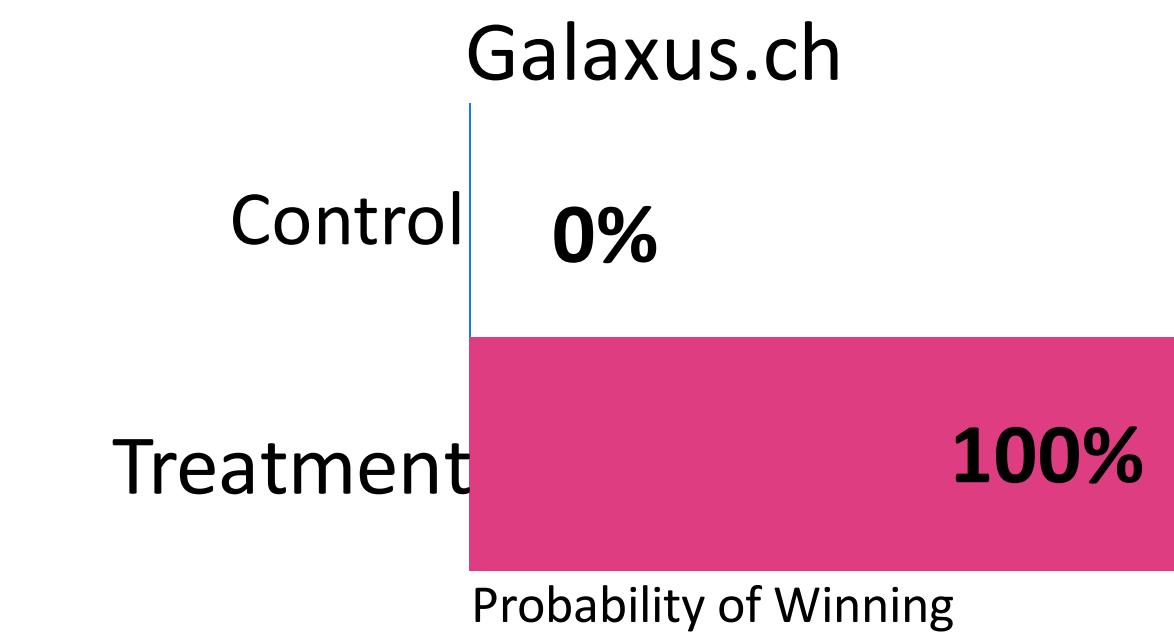
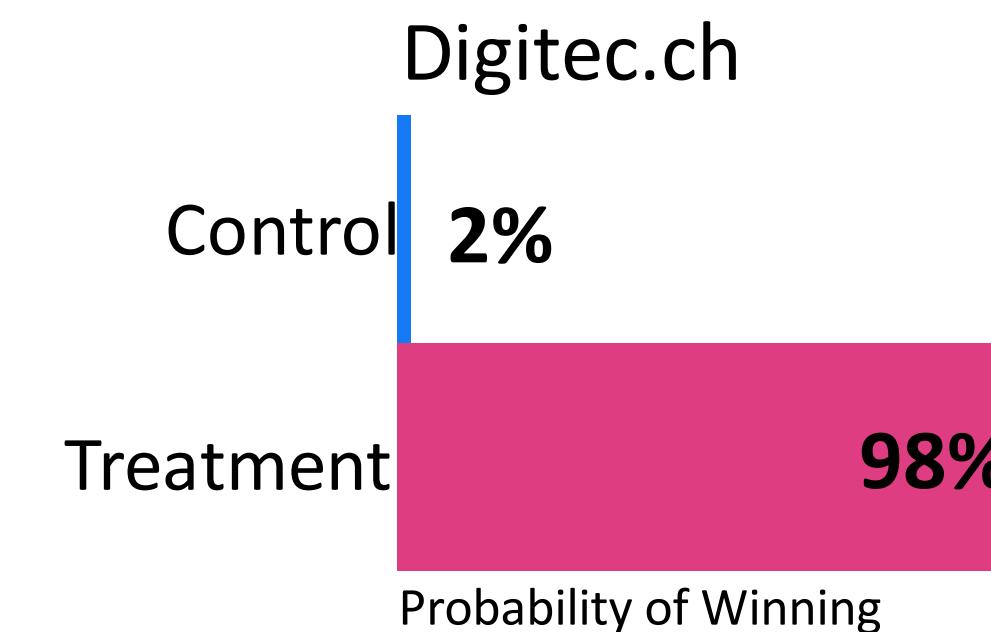
- Options are re-calculated daily (not hardcoded)
- Improved UI

# AB Testing the 2<sup>nd</sup> model

most popular filter options

Similar user behavior as with the MVP -> **Drop in the standard filters** usage compensated by **increased CTR** in the **Quick Filters**

Significant increase in Click-through-rate on search results on both portals

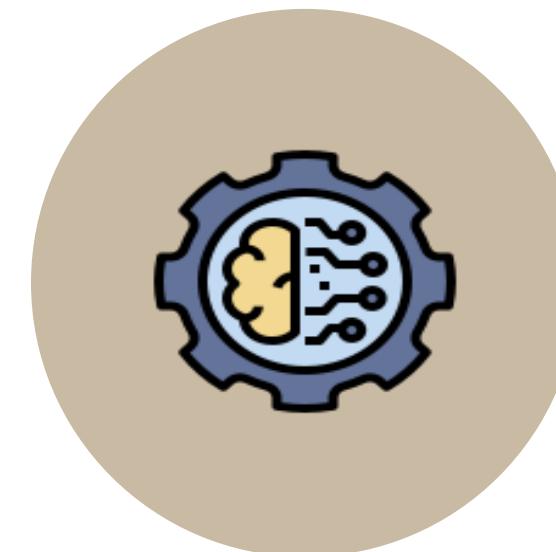


# The Quick Filters Journey

Make Quick filters swiftly adapt to hot trends and seasonality

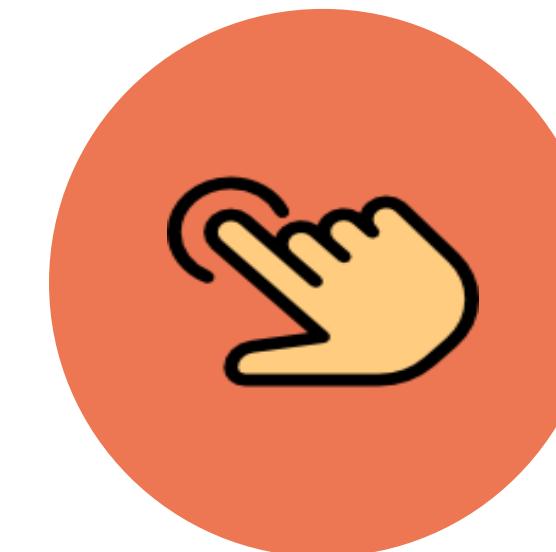
## Minimum Viable Product

Leverage behavioral data to create Quick filters



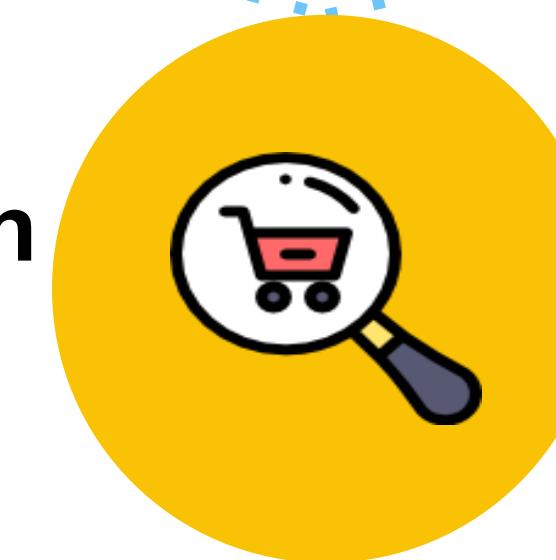
## New Signals

Include popularity, new trends, seasonality to the model



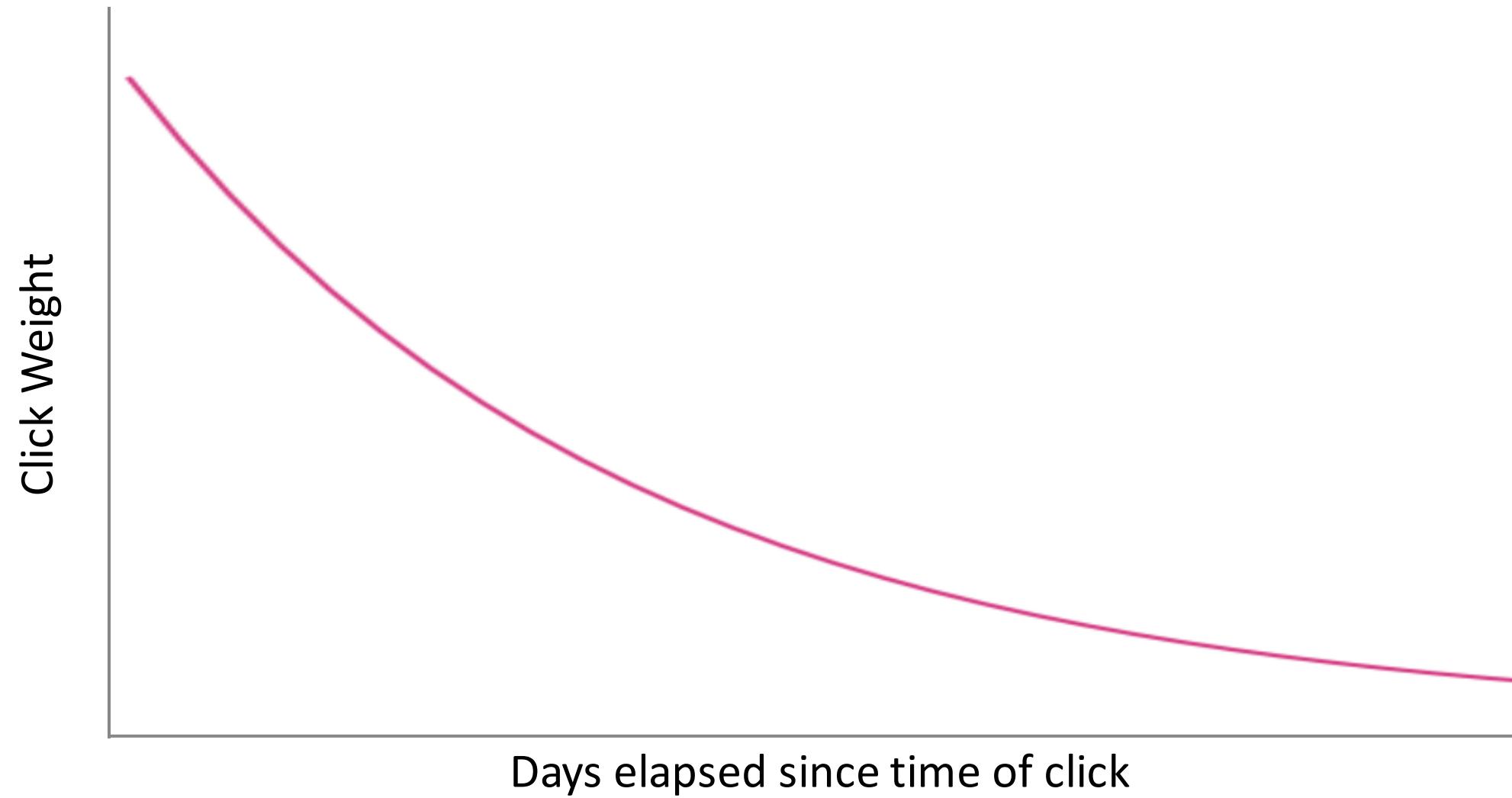
## Iteratively refine solution

Optimize MVP-Model leveraging A/B test insights



# Not all clicks are alike

Weight clicks based on recency



Example:

Filter option A has 5 clicks from yesterday and 10 clicks from last year.

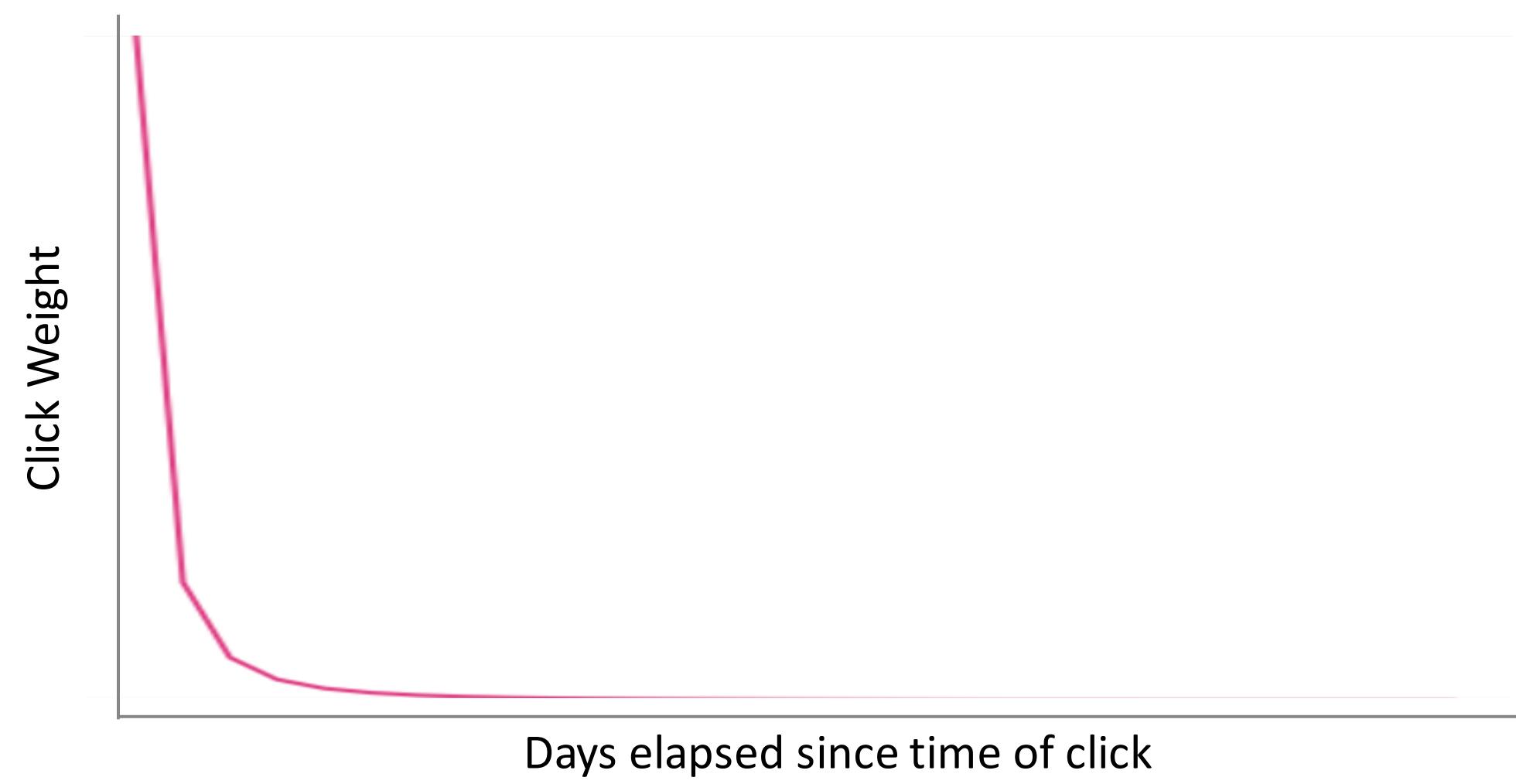
Filter option B has 12 clicks from yesterday.

$$\text{Popularity Score A} = 5 \bullet 1 + 10 \bullet 0.5 = 10$$

$$\text{Popularity Score B} = 12 \bullet 1 = 12$$

# Not all clicks are alike

Weight distributions for trends and seasonality



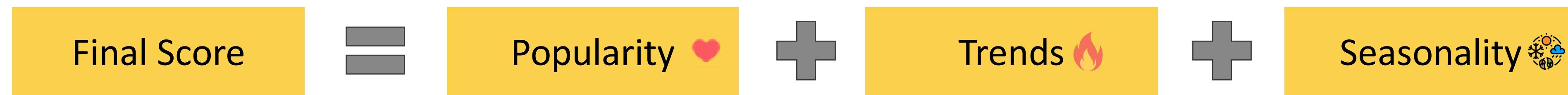
Trends 🔥



Seasonality 🌫️

# Not all clicks are alike

Combining different signals into one score



# Understanding the model

## Results for **umbrella**

3'768 products

### Popular filters



pocket umbrella



Popularity



Trend



Seasonality

parasol



Popularity



Trend



Seasonality

# Learnings and pitfalls

- Click data can be elevated by assigning weights
  - A simple model is explainable

- No A/B-Test
- Deployed UX changes affecting quick filters at the same time.
  - Released shortly before Christmas season

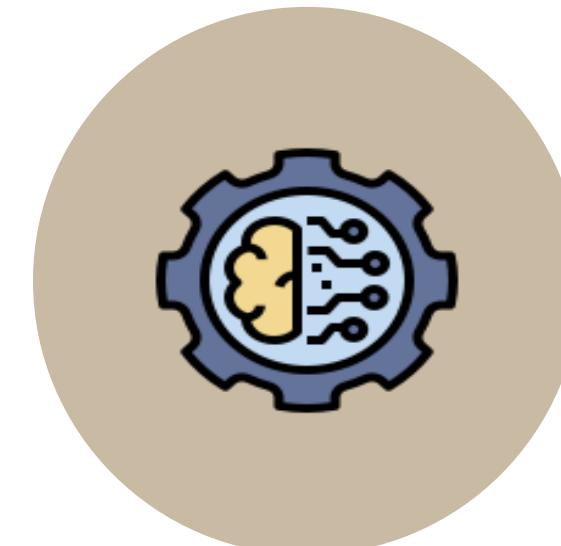
➤ Now we cannot tell what caused the effect.

# Rounding off the journey

## Monitoring and fixing edge cases

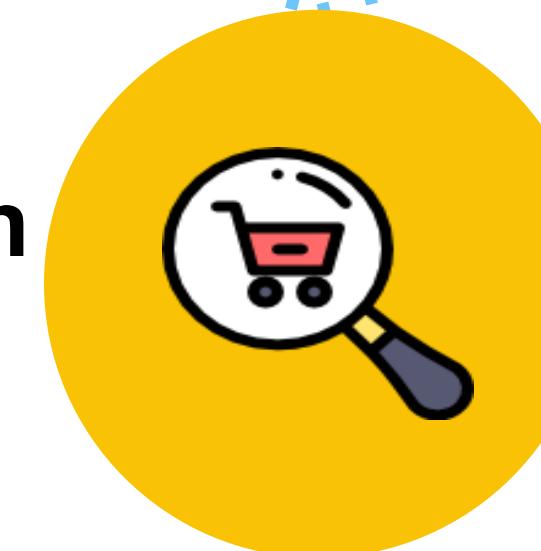
### Minimum Viable Product

Leverage behavioral data to create Quick filters



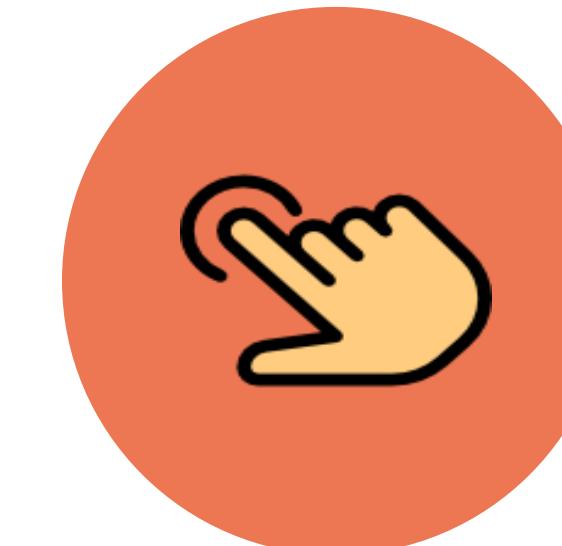
### Iteratively refine solution

Optimize MVP-Model leveraging A/B test insights



### New Signals

Include popularity, new trends, seasonality to the model



### Monitoring & Edge cases

Discover edge cases and fix them

# Question time!

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