

# Innovative Compliance Solutions

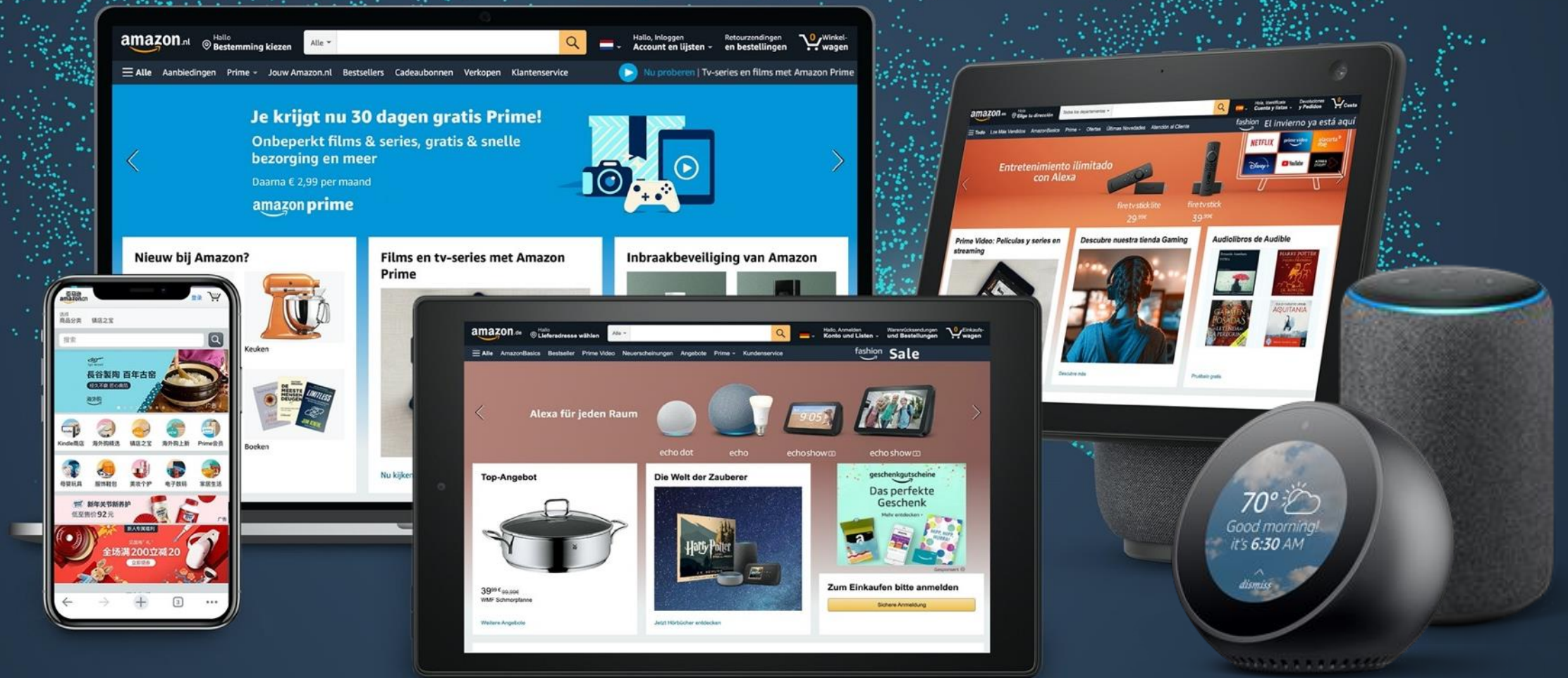
Amazon's Machine Learning-Powered Safety and Compliance Capabilities



# Every continent receives Amazon items and services



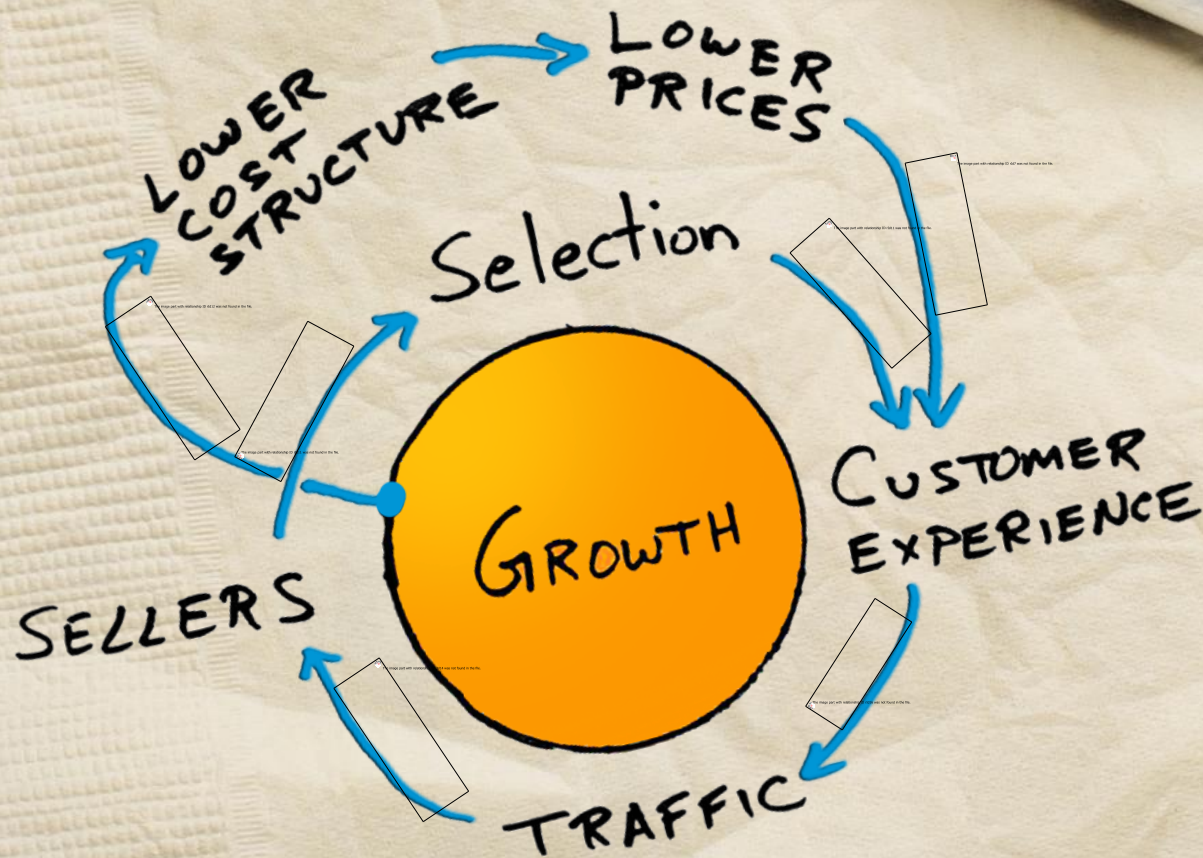
# Our technology is built to enable the best customer experience



PARS strives to  
ensure compliance  
worldwide









Customer safety & regulatory compliance are **top priorities**



## Proactive

Safety controls prior to active listing



**SELLER**

Identity  
verification

Safety &  
compliance  
agreements

Prohibited  
items blocked

Additional  
requirements  
for certain  
High-risk  
products

**UPSTREAM – BEFORE LISTING**

**DOWNSTREAM – AFTER LISTING**

Safety  
issue detection,  
investigation  
and  
enforcement

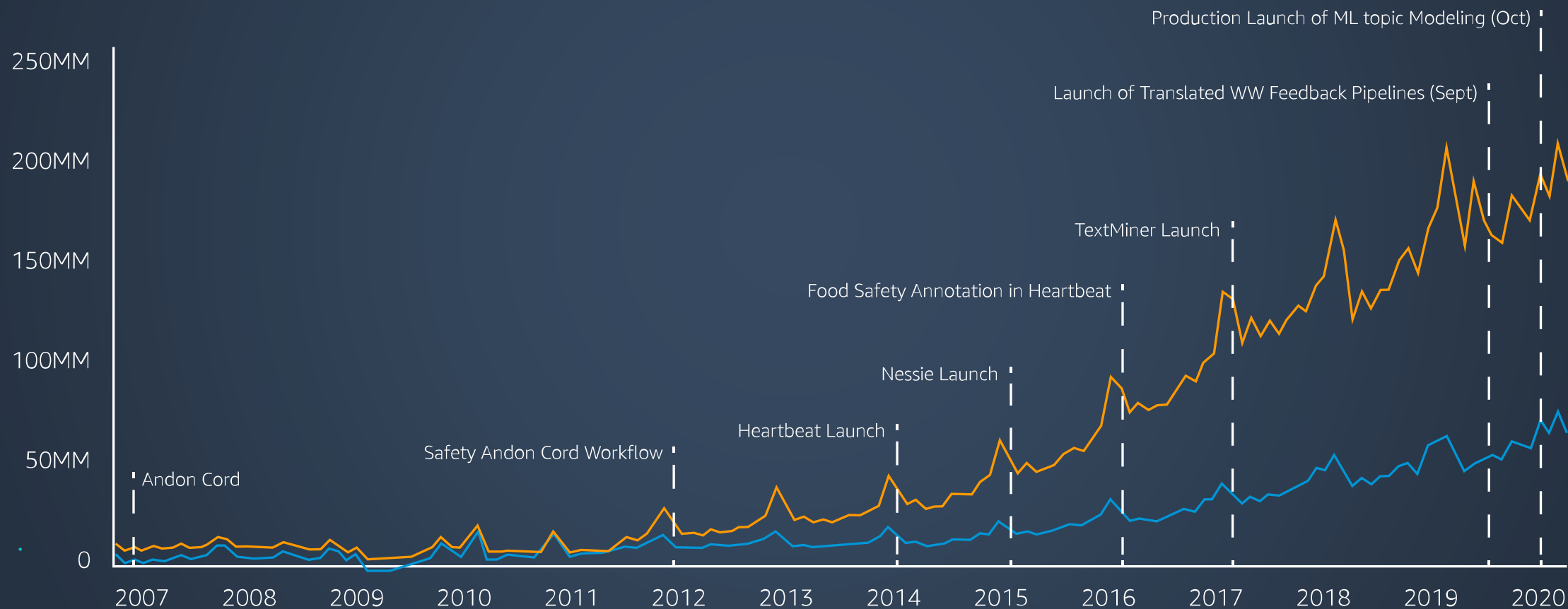
Product  
recalls  
monitored and  
addressed

## Reactive

Safety controls during active listing

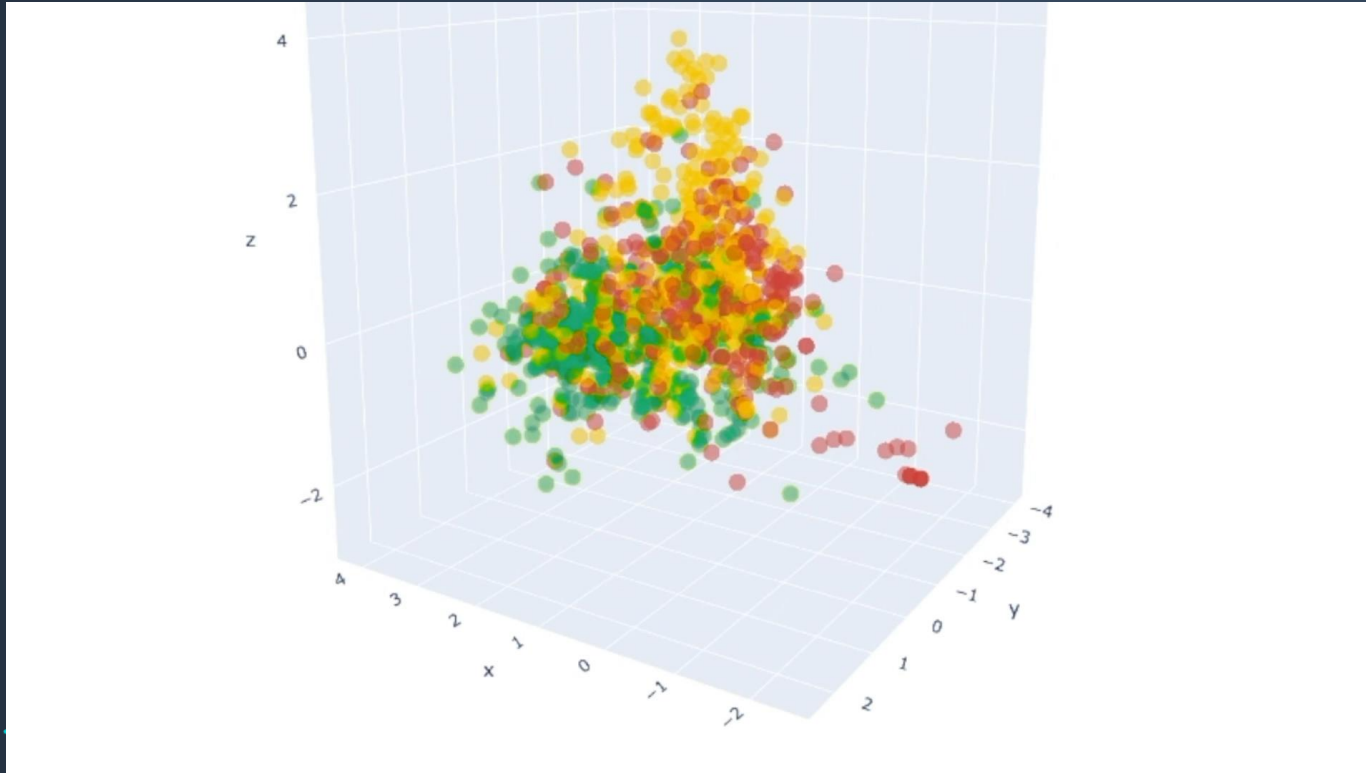
# How Do We Listen?

— Other input  
— CS Contacts





# Creating Product Clusters



## Distance

$$d(ASIN_1, ASIN_2) = \sum_i w_i \|F_i^{ASIN_1} - F_i^{ASIN_2}\|$$

where force  $F_i$  quantifies the strength and direction of feature  $f_i$

$$F_{Item\ Name} = \xi_K(f_{Item\ Name})$$

$$F_{Brand\ Name} = \xi_K(f_{Brand\ Name})$$

$$F_{Price\ Deviation} = \Phi(f_{Price\ Deviation})$$

$$F_{ITK} = \xi_K(f_{ITK})$$

and their  $w_i$  weighted differences weights determine the products' similarity. In this example,  $\xi_K$  is a word-embedding function of length  $K$  and  $\Phi$  is the percentile of the price distribution.

# Customer Reviews

★★★★★ I SHOULD HAVE READ THE REVIEWS  
Reviewed in the United States on May 30, 2020  
Verified Purchase

The battery arrived with its label side **swollen**. The entire labeled side is a large sticker meant to protect the inner contents, it is **peeling away** as a result of the 3 **swollen battery** cells, I expected the battery to have a hard case on all sides. It is a three-cell battery and all three cells are **bulging** through the sticker label. STAY AWAY. It took a day for it to arrive and now I have to wait 11 days for a replacement.



```
{
  "sentence": "The battery arrived with its labeled side swollen.",
  "sentenceWordCount": 9,
  "sentiment": "negative",
  "sentimentConfidence": 0.7740520709469273
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{
  "sentence": "The entire labeled side is a large sticker meant to protect the inner contents, it is peeling away as a result of the 3 swollen battery cells, i expected the battery to have a hard case on all sides.",
  "sentenceWordCount": 42,
  "sentiment": "negative",
  "sentimentConfidence": 0.851156348941662
},
{
  "sentence": "It is a three-cell battery and all three cells are bulging through the sticker label.",
  "sentenceWordCount": 16,
  "sentiment": "negative",
  "sentimentConfidence": 0.4165803559704677
},
{
  "sentence": "protect the inner contents.",
  "sentenceWordCount": 3,
  "sentiment": "neutral",
  "sentimentConfidence": 0.5280451877061273
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  "sentence": "it took a day for it to arrive and now I have to wait 11 days for a replacement.",
  "sentenceWordCount": 20,
  "sentiment": "negative",
  "sentimentConfidence": 0.813806833961521
}
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POTENTIAL  
SAFETY  
ISSUE

# Language and context matter



Mike

★☆☆☆☆ **Tube Exploded**

Reviewed in the United States on January 11, 2020

Color: White | Size Name: 10.1oz | **Verified Purchase**

Caulk gun couldn't push anymore to get it started, backed it up a bit and the tube **exploded**. What should of been a one tube job will now take 2. I feel like I was shorted on the amount they put in too. Ill gladly try another brand next time.



Not  
safety  
issue



Brian Barnes

★☆☆☆☆ **Avoid this like the plague!**

Reviewed in the United States on March 7, 2021

**Verified Purchase**

My headset didn't fit when it first arrived but thought I'd give it a shot before leaving a bad review big mistake. I left it plugged in over night, when I tried to unplug it, the cable had been **melted into the case** and couldn't be removed. Glad my headset didn't fit or that would have been **toasted** too. I'm just glad it didn't **set my desk on fire or burn the condo down**.



Potential  
Safety  
issue

# Rapid-rate reaction Customer Service teams

24

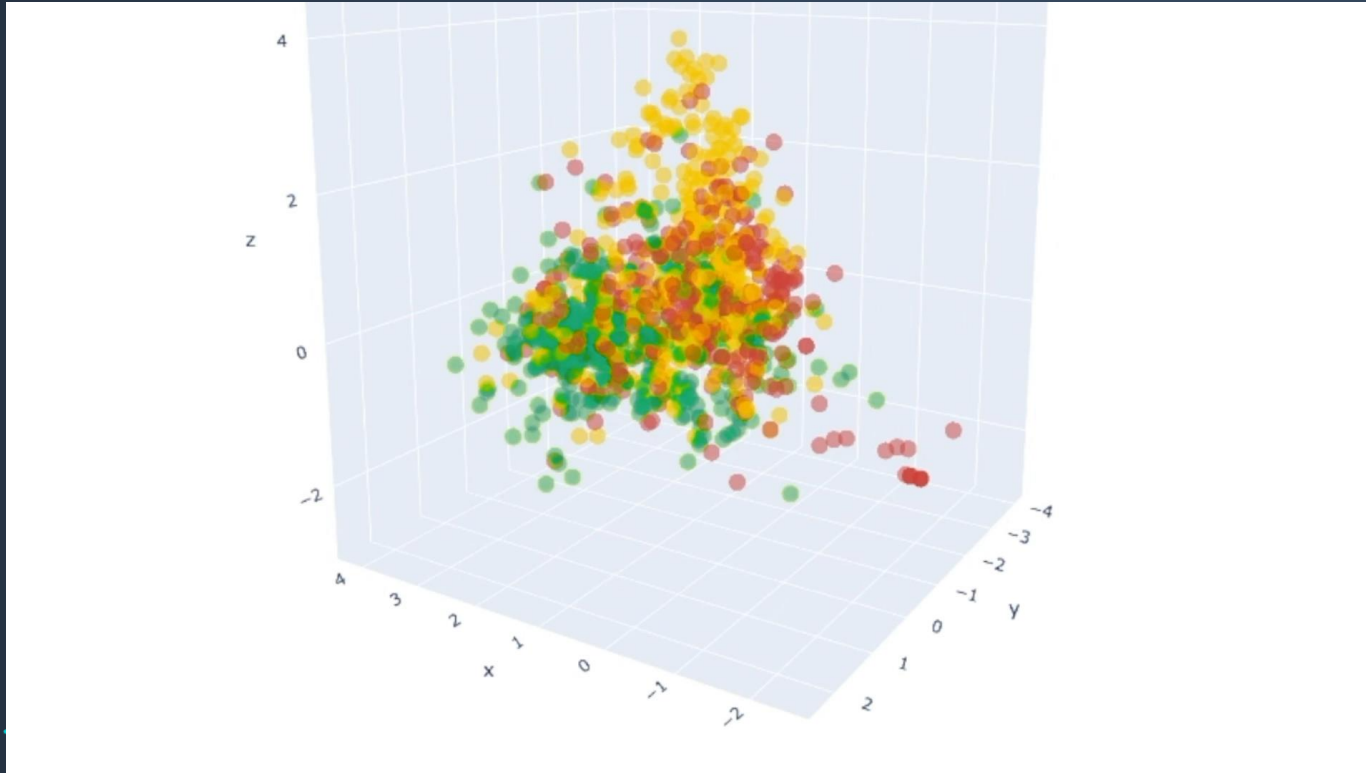
7

365





# Creating Product Clusters



## Distance

$$d(ASIN_1, ASIN_2) = \sum_i w_i \|F_i^{ASIN_1} - F_i^{ASIN_2}\|$$

where force  $F_i$  quantifies the strength and direction of feature  $f_i$

$$\begin{aligned} F_{Item\ Name} &= \xi_K(f_{Item\ Name}) \\ F_{Brand\ Name} &= \xi_K(f_{Brand\ Name}) \\ F_{Price\ Deviation} &= \Phi(f_{Price\ Deviation}) \\ F_{ITK} &= \xi_K(f_{ITK}) \end{aligned}$$

and their  $w_i$  weighted differences weights determine the products' similarity. In this example,  $\xi_K$  is a word-embedding function of length  $K$  and  $\Phi$  is the percentile of the price distribution.

In a universe of listings, we use  
ML to evaluate safety indicators



The slide features a dark blue background with a large, thin-lined circle in the center. Inside this circle, the words "Thank you" are written in a white, sans-serif font. Below the text is a white, curved arrow pointing towards the bottom right. The background is decorated with several concentric circles of varying shades of blue and green, some of which are composed of small dots. There are also some larger, faint circular patterns and a few small, solid blue dots scattered around the edges.

Thank you