# Assessing the importance of user-defined product dimensions in reviews

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# Problem definition

What **product features** are most important to consumer experience across various **product categories**?


Gourmet food
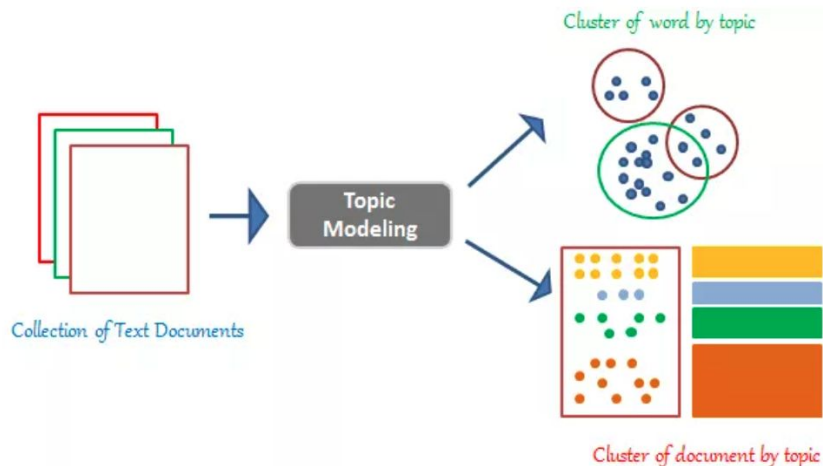

Toys & games


Fashion


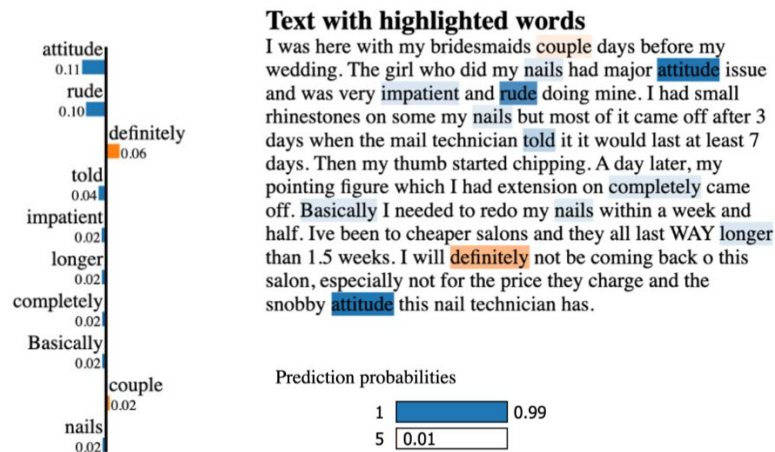Magazine subscriptions


Appliances


Musical instruments

# Possible approaches to solving this problem…

## MACRO (full corpus)



Latent dirichlet allocation (LDA)

## MICRO (review per review)



Local interpretable model-agnostic explanations (LIME)

# … But these methods are not ideal

## MACRO (full corpus)

**Assignment of documents to clusters using topic modeling (LDA):**

- **Completely unsupervised** method:
  - Classes may not capture incoming belief / hypothesis
  - Overlapping classes (some words present in different clusters)
  - Difficulty to interpret clusters
- Does not necessarily capture positive / negative sentiment

## MICRO (review per review)

**Localized interpretable explanations (LIME):**

- Potentially **unstable** due to random sampling of words picked for reshuffling (could pick correlated words)
- **Not scalable** (interpretation of significant words is done for each document individually)

**What if I could: define my own dimensions, and assess their importance in a scalable fashion?**

# Proposed approach to identifying drivers of user experience
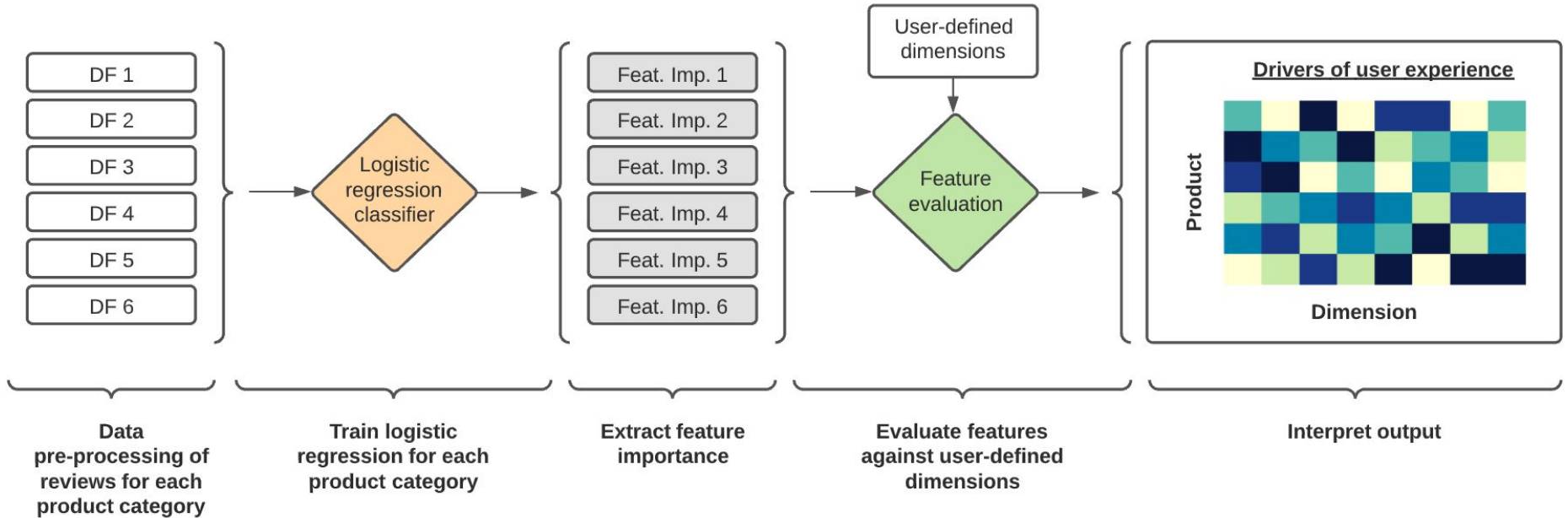
# This approach allows users to test a set of hypotheses (by defining their own set of dimensions)

**Experience depends on…**

**As defined by synonyms and their neighbors**

| Experience depends on… | As defined by synonyms and their neighbors |
|---|---|
| **Product's aesthetics** | [ Beautiful, ugly, appearance ] |
| **Product's sensory appeal** (smell/touch/taste) | [ Aromatic, smelly, sensory ] |
| **Product's fit or size** | [ Fit, bulky, weight ] |
| **Product's delivery** | [Delivery, timely, delay ] |
| **Product's ease of use** | [ Intuitive, demanding, straightforward ] |
| **Product's performance** | [ Functional, defective, operational ] |

The 5 nearest neighbor to each dimension synonym are extracted from pre-trained GLOVE embeddings to fully define a dimension
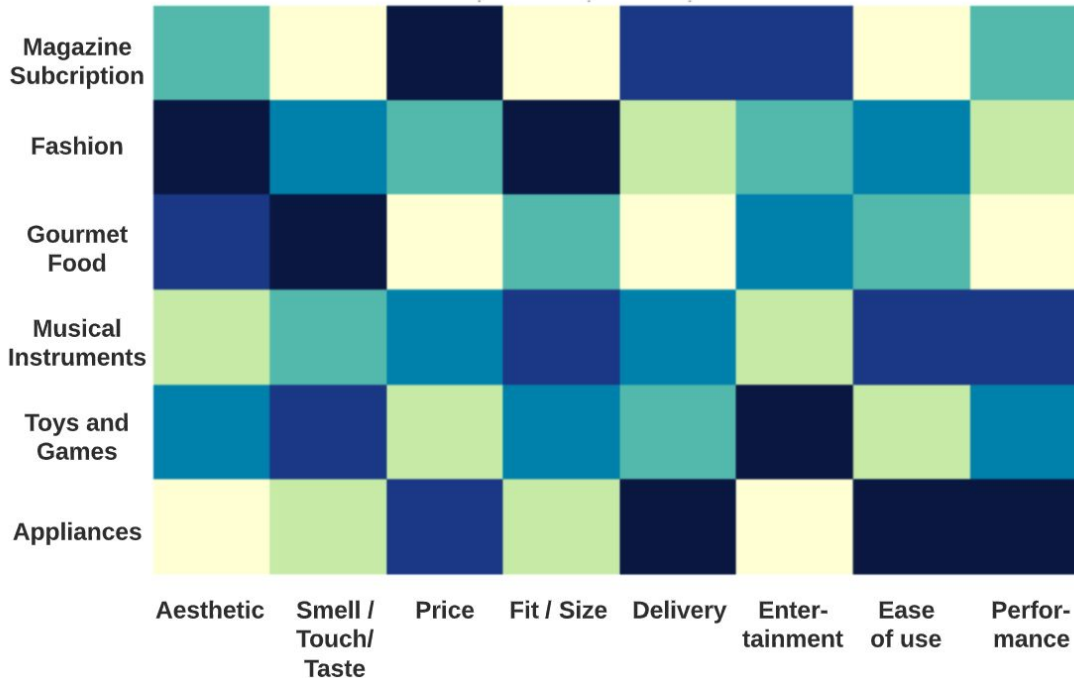
# Running the algorithm allows us compare product categories easily

**Product Category**

Magazine Subcription

Fashion

Gourmet Food

Musical Instruments

Toys and Games

Appliances

Aesthetic    Smell / Touch/ Taste    Price    Fit / Size    Delivery    Enter-tainment    Ease of use    Perfor-mance

**Relative Importance of Customer Experience Dimension**

**Row-wise:**

**What dimensions matter for buyers of this product**

**Column-wise:**

**Which product 'spikes' most on this dimension?**

# Direct comparisons of products can be achieved in the web app

## App user inputs:



## Output: