

Real-world Applications of LLMs for eCommerce

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Presented at ISIR-eCom @ WSDM 2024

Mar 8th, 2024, Mérida, Mexico

Who I am

Since 2022: VP of Engineering at Crossing Minds

Previously: Director of ML Engineering at Spotify

Experience: Recommender systems, information retrieval, machine learning, signal processing, computer vision

Organizer:

- Spotify Million Playlist Dataset Challenge / RecSys Challenge 2018
- PodRecs @ RecSys 2020, 2021: Workshop on Podcast Recommendations



Who is Crossing Minds?

- An **AI Personalization Platform** founded in 2017 by Alexandre Robicquet, Emile Contal, and Sebastian Thrun
- We provide a highly scalable **Recommendations API**, along with **AI-based Data Enrichment** and **Conversational Search**.
- We serve over 30 customers in the media, financial, education, and **eCommerce** industries.
- Within eCommerce, we work with a number of **brands**, **retailers**, and **marketplaces**.

CHANEL



Bonhams



Rails

Flink

KOHL'S



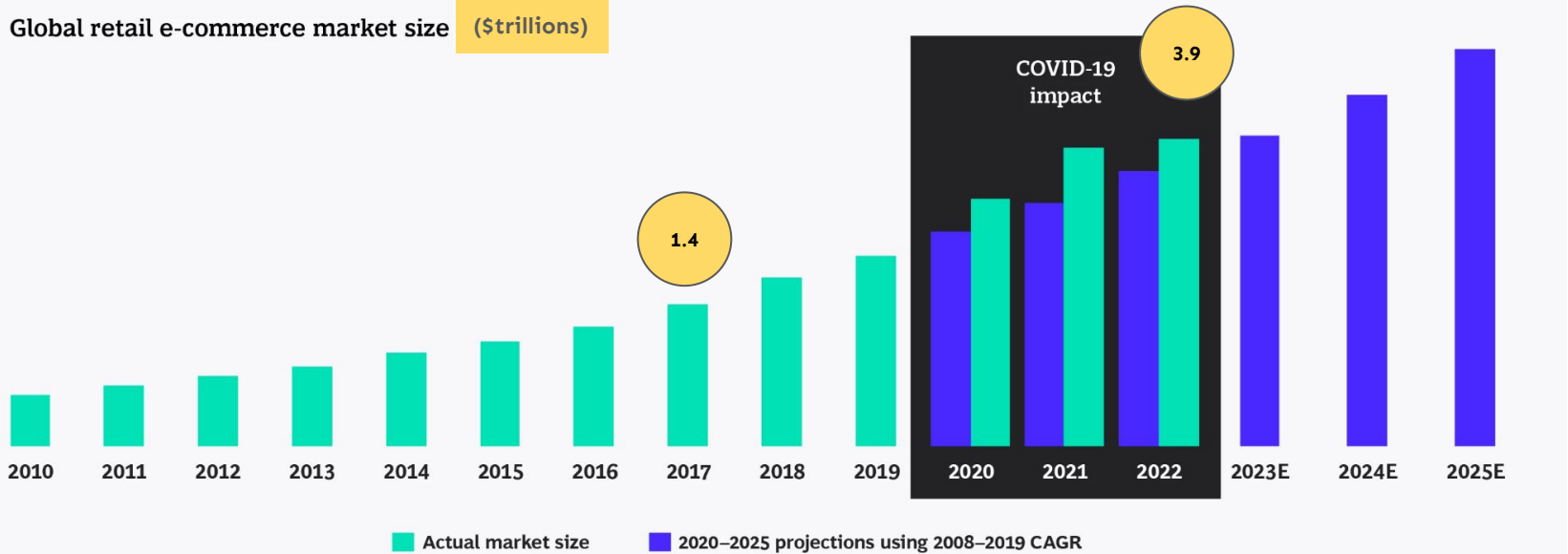
 **DRINKS**

 **dutchie**

Trends in eCommerce

E-commerce acceleration slowed in 2021–2022 but is returning to its long-term trend line

Global retail e-commerce market size (\$trillions)



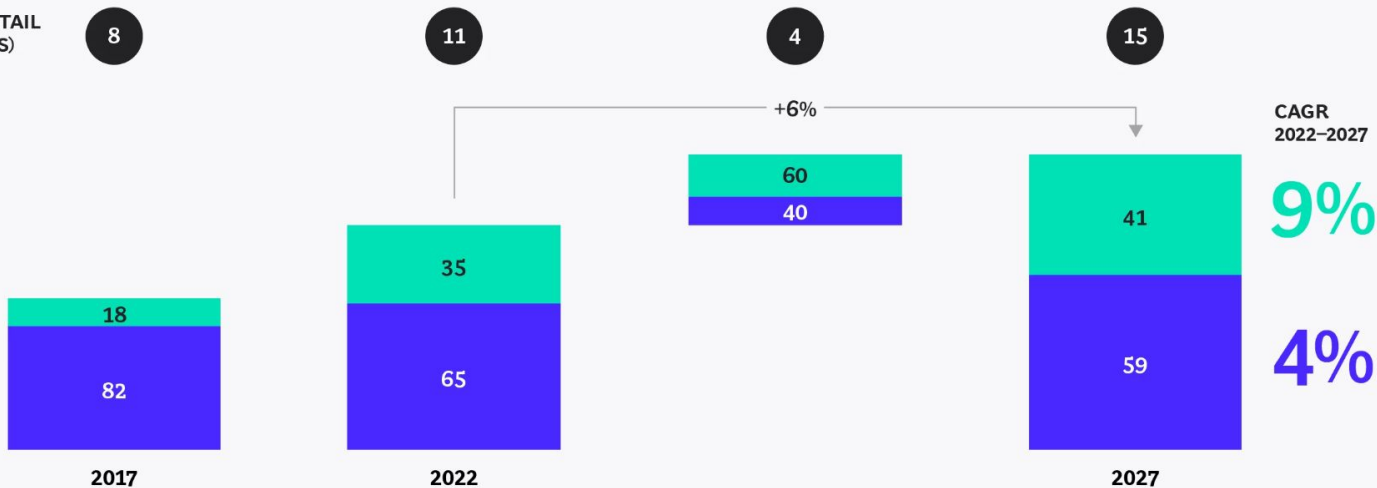
Source: Euromonitor.

Note: Growth is worldwide and includes all categories and all retail and CPG e-commerce distribution types (pure, specialty, and grocery players).

E-commerce to lead global retail sales growth by 2027

Share of retail sales (%)

GLOBAL RETAIL
(\$TRILLIONS)



Sources: BCG's Worldwide E-Commerce Survey 2023; Foxintelligence; Edge by Ascential.
Note: E-commerce includes both retail and CPG companies.

Mobile Commerce

- In 2023, Mobile Commerce accounted for 42% of all eCommerce sales

Retail Mcommerce Sales in the US, 2019-2025

billions, % change, and % of total retail ecommerce sales

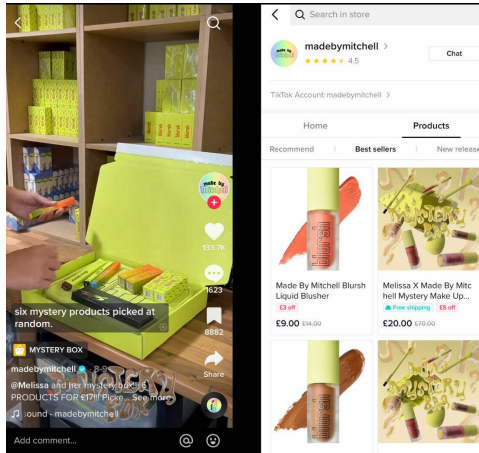
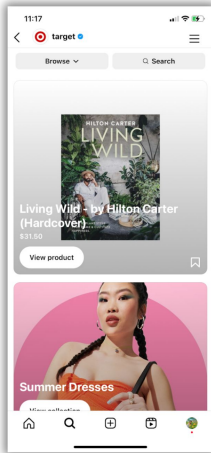


Note: includes products or services ordered using the internet via mobile devices, regardless of the method of payment or fulfillment; includes sales on tablets; excludes travel and event tickets, payments such as bill pay, taxes, or money transfers, food services and drinking place sales, gambling, and other vice goods sales

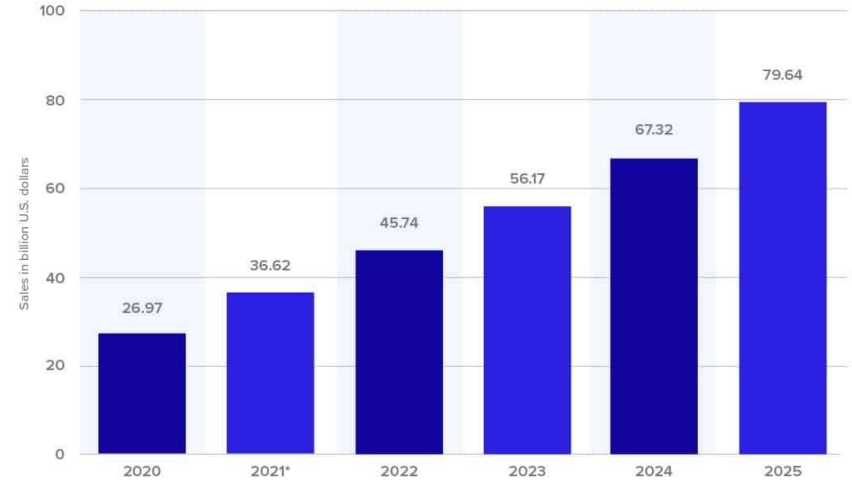
Source: eMarketer, May 2021

Social Commerce

- Social Commerce in the US accounted for \$56.2B in 2023, and is projected to grow to **\$79.6B by 2025**.
- Social commerce is **much larger** in China.



Social commerce sales in the United States from 2020 to 2025 (in billion U.S. dollars)



Sources
Business of Apps; eMarketer
©Statista 2021

Source: [Statista](https://www.statista.com)

Shifts in distribution

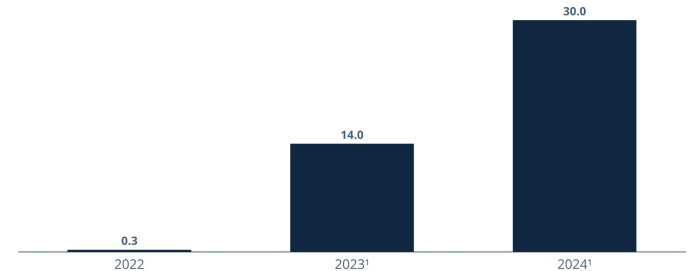
- Shopify** and other integrated eCommerce platforms have enabled **sellers of all sizes** to enjoy the same tech stack enjoyed by only the larger online stores decades ago. The number of merchants on Shopify has grown from 1M in 2019, to **over 2.3M in 2024**.
- Temu, Shein, Aliexpress and other **manufacturer-to-consumer (M2C) marketplaces** have had a meteoric rise in the last few years, capitalizing on budget-conscious shoppers in a high-inflation financial climate.

Active Stores by Quarter



Source: [Store Leads](#)

GROSS MERCHANDISE VOLUME (GMV) ON TEMU.COM, 2022-2024
in billion US\$



Notes: (1) Forecast.
Sources: ECDB.

ECDB

Source: [ECDB](#)

Challenges in eCommerce

Challenges faced by eCommerce businesses

Content

Rich product **metadata** is crucial for discoverability both on site and off, but metadata is **costly** to manually create, and quality and **coverage can vary wildly**.

Challenges faced by eCommerce businesses

Content

Rich product metadata is **crucial** for discoverability both on site and off, but metadata is costly to manually create, and quality and coverage can vary wildly.

UX

Modern shoppers are beginning to **shift** from “**search engine**” mindsets to personalized **feeds**, and **conversational** interfaces.

Enter the LLM



- Large Language Models, or **LLMs** were built upon prior research in Deep Learning, particularly the **Transformer** architecture.
- **ChatGPT** by OpenAI was the most successful application of LLMs that ushered in the current era of **Generative AI** in mainstream culture.
- So what exactly can LLMs do?

LLMs can **talk**

FL

Hi, I'm writing an article about you and all of the cool things you can do. Could you say hello to my readers and give us a quick self-introduction? I'd like it to be friendly and casual, include a silly joke, and end with a note about how great the rest of my article is.



Hello readers! My name is Assistant, and I'm a large language model trained by OpenAI. I'm here to help answer your questions and provide you with information on a wide variety of topics. I'm a bit of a jokester, so here's a quick one for you: Why was the math book sad? Because it had too many problems! But seriously, I'm excited to be featured in your article and I hope you enjoy learning more about me and all the cool things I can do. And trust me, the rest of the article is going to be great!



LLMs can summarize

bryce canyon arches best for family of kids under 3

Family Can Travel
<https://www.familycantravel.com/bryce-canyon-nati...>

Ultimate Guide to Bryce Canyon National Park with Kids

Jan 25, 2024 — One of the best things to do in Bryce Canyon for kids is the Junior Ranger program (for kids ages 3 and up.) To earn a Bryce Canyon Junior ...
Hiking Fairyland Loop Trail · Red Canyon Hiking · Kodachrome Basin State Park

Family Can Travel
<https://www.familycantravel.com/arches-national-par...>

Arches National Park with Kids

May 1, 2023 — Playing at the beach under the Sand Dunes Arch is one of the best things to do in Arches for kids.
1. Delicate Arch Trail · 2. Devil's Garden Loop Trail · 2. Delicate Arch Lookout...

exploringthroughlife.com
<https://exploringthroughlife.com/utah-national-parks...>

Visiting Utah's National Parks with Young Kids

Feb 24, 2021 — One of the most impressive arches in the park is Delicate Arch. If your kids are great hikers, you can hike the 3 miles out to see it up close.
Can You Road Trip Through... · What To Do At Each Park · Zion National Park With...

Tripadvisor
<https://www.tripadvisor.com/.../Utah-Travel-Forum>

Help: Arches or Bryce NP in Mid-February with 2 young kids?

Jan 2, 2014 — We didn't plan anything specifically kid related - we mostly just hiked. Arches is a great park for kids because there is a lot to see with ...
10 answers · Top answer: Just found out that driving from SLC to Arches NP is shorter, 3.5hr, ...

Full Suitcase
<https://fullsuitcase.com/arches-national-park-kids>

Best Things to Do in Arches National Park with Kids

Jan 23, 2024 — If you are visiting Arches with young kids, you can see Delicate Arch in the distance from the Delicate Arch viewpoint along the scenic drive.



what's better for a family with kids under 3 and a dog, bryce canyon or

Generative AI is experimental

Both Bryce Canyon and Arches National Parks are family-friendly. Although both parks prohibit dogs on unpaved trails, Bryce Canyon has two paved trails that allow dogs.

Bryce Canyon has distinctive features like hoodoos, natural bridges, and waterfalls. At the visitor center's interactive exhibits, children can learn about the geology, wildlife, and people of the area. You can bring your dog on the paved sections of both the Rim Trail and the Shared Use Path, both of which are also stroller-friendly.

At Arches, children may enjoy the rock formations, and some say that Arches has more variety than Bryce Canyon. Pets aren't allowed on any trails, though they are allowed at campgrounds, pullouts, roads, and parking lots.

Both parks offer guided tours, ranger-led programs, picnic areas, and restrooms, and both parks require pets to be leashed.

Ask a follow up · How long to spend at Bryce Canyon with kids? · How many days do you need in Arches National Park for kids?

Action Tour Guide
<https://actiontourguide.com/2022/02/17/which-is-b...>

Action Tour Guide

Feb 17, 2022 — Arches only allow dogs at campgrounds, parking lots, and along established roads, making it a lot harder to experience the park with your dog.

The MOM Trotter
<https://themomtrotter.com/bryce-canyon-national-pa...>

A Guide To Planning A Trip To Bryce Canyon National ...

They have **common sense**

- LLMs have been trained on massive datasets of **all types of human knowledge** available on the Internet, effectively giving them some sense of cultural awareness.
- In the context of eCommerce, they perform well at **cultural associations** between objects and concepts, such as knowing that you should wear shorts and flip-flops to the beach, or that you should have an umbrella when it's raining.

You

Briefly state 3 essential items one should bring on a trip to Mexico

ChatGPT

When traveling to Mexico, considering its diverse climates, cultural attractions, and activities, three essential items you should bring are:

1. **Valid Passport and Copies:** Mexico requires a valid passport for entry. It's also wise to bring photocopies of your passport and other important documents in case of loss or theft.
2. **Sun Protection:** Given Mexico's generally sunny and warm climate, sun protection is crucial. This includes high-SPF sunscreen, sunglasses, and a wide-brimmed hat to protect against sunburn and heatstroke, especially if you plan to spend a lot of time outdoors.
3. **Comfortable Footwear:** Whether you're exploring ancient ruins, wandering through colonial cities, or walking on the beach, comfortable and durable footwear is a must. Consider the activities you plan to do and pack accordingly—this might mean hiking boots, sandals, or water shoes.

These items help ensure your safety, comfort, and ability to fully enjoy the wide range of experiences Mexico has to offer.

LLMs can **see**



Captioning Model

A happy dog is standing in the ocean

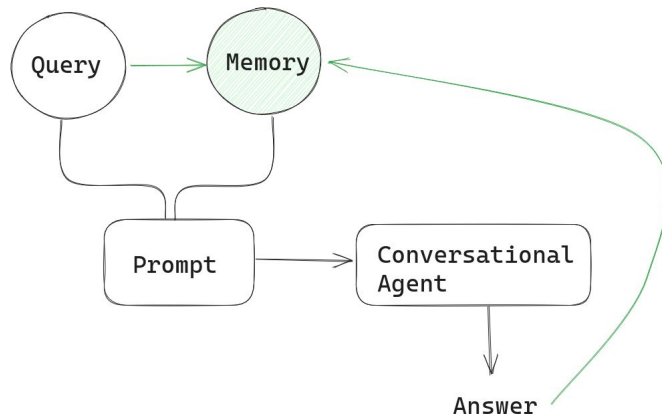
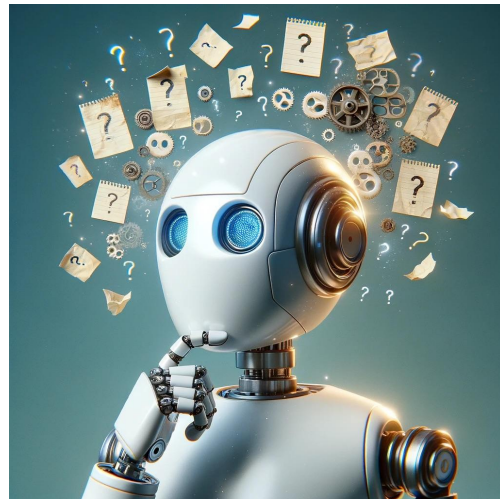
BUT... LLMs can **hallucinate**

- LLMs cannot reliably recall **precise** information from the training corpus.
- They often “**hallucinate**” and generate outputs that seem plausible, but are factually incorrect.



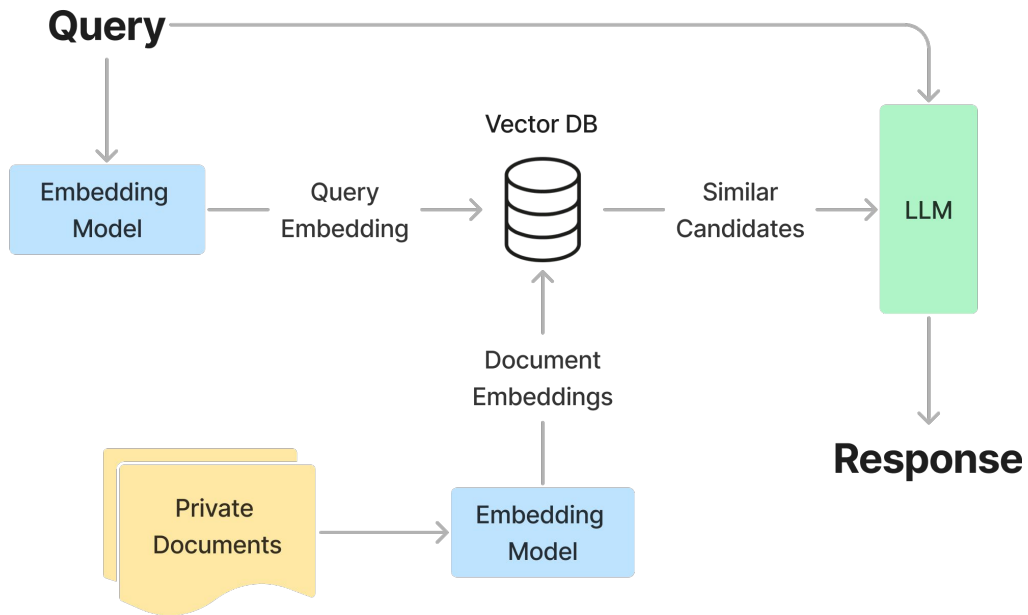
And they can't **remember** very well

- **Context**, such as the previous chat message and response, or private knowledge such as a product catalog, must be **explicitly passed** into each prompt.
- Prompt windows are getting larger (Gemini Pro 1.5 has a 1M token context size), but most common LLMs are **limited to thousands of tokens**, limiting their use for certain applications.



Making LLMs better at knowledge-intensive tasks

- **Retrieval Augmented Generation (RAG)** is a technique that combines the general knowledge of LLMs with specific knowledge from a private dataset.
- By using a retrieval stage before the LLM to get a smaller **set of candidates** relevant to the query, you reduce the amount of space needed in the context window.



Applications of LLMs in eCommerce

Solving eCommerce's problems with LLMs

Content

- Data normalization
- Image tagging
- SEO
- Translation
- Content generation

UX

- Semantic search
- Conversational discovery
- Product research and comparison
- Customer support

Content

Solving eCommerce's problems with LLMs

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Data Normalization

- Product metadata comes in all formats and completeness. Here the LLM takes the available metadata, and uses its **summarization** and **Q&A** capabilities to extract consistent metadata properties.

Body HTML	Tags
<p><p>Inspired by the industrial style of the classic barn light, the Factory Light 6 Cord LED Pendant is pared down to sleek curves in handspun heavy gauge steel. A Schoolhouse take on the utilitarian, our meticulous attention to detail is apparent in the clean, deliberate lines and carefully hand-painted finishes.</p></p> <p><p>Suspended in space from a sleek vinyl cord, this pendant works in any space, whether its used to illuminate the whole room or a countertop. Each shade is handspun from steel and hand-painted in the Schoolhouse Factory.</p></p> <p><p>Assembled in our Portland, Ore. factory using ethically-sourced domestic and global components. A Schoolhouse Original.</p></p>	<p>artisan-picks,best-of-both,blog-home-tour-sara-parsons,damp_porch_patio,ETA18,ETA_18,F17,factory,factory_pendants_chandeliers,findify-new,fulmade,functional-artistry,Integrated LED Fixture,L-Nav18,LED_pendants_chandeliers,length_shade,Lighting,lighting-hardware,No_Return,Pendant,Pendant Fixtures,pendants_chandeliers,PFA23,PFA23-Lighting,promo-010322-22,promo-051923,promo-052622-15,promo-052622-outdoorlighting,promo-080222-20,Schoolhouse Signature,schoolhouse-wanders,Sept20LightPromo,stories/the-beauty-of-schoolhouse-led-lighting,traditional-industrial,Utilitarian</p>



“How would you describe the {COLUMN} of this product?”

Type	Lighting	Style	Cord	Assembled
Pendant	Integrated, LED	Industrial, Barn, Sleek	Yes, Vinyl	Portland

Solving eCommerce's problems with LLMs

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- **Image tagging**
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UX

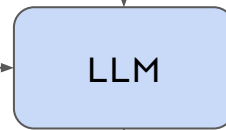
- Semantic search
- Conversational discovery
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Image Tagging

- In many cases, rich product metadata is unavailable, however images are usually available.
- An LLM's multimodal input capability can be used to **describe** an image using specific tags in the prompt.



"How would you describe the {COLUMN} of this product?"



Color	Pattern	Neckline
Black	Quilted	Mandarin

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- **SEO**
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Search Engine Optimization (SEO)

- SEO can help products be discovered by search engines.
- We can again leverage LLM's **summarization** and **generative descriptiveness** capabilities to help us find tags that will likely match with the terms shoppers use to search for specific products.
- These tags can be used to enrich an on-site search engine, or used in HTML meta tags to aid in external search engine optimization.

Search Engine Optimization (SEO)

“What are common search terms that could make the banana more discoverable in search engines?”

[Produce](#) / [Fruit](#) /



Search terms

Banana

Fresh fruit

Healthy Snack

Smoothie

Baking

Breakfast

Banana (each)

 Enter your address to view full delivery information.

[Sign In](#)

[Set Address](#)

\$0.40 ea



1



Add to cart - \$0.40

Solving eCommerce's problems with LLMs

Content

- Data normalization
- Image tagging
- SEO
- **Translation**
- Content generation

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Translation

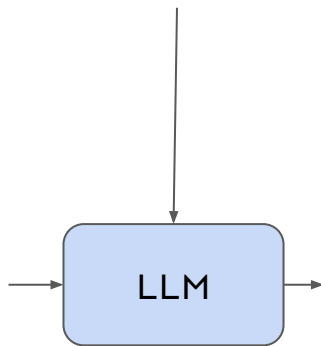
- With the growth of **global** eCommerce, stores have more to gain from selling to customers from other countries.
- Many LLM's like ChatGPT are **multilingual**, and can be used to easily translate entire product catalogs from one language to another.

Translation



グッドスマイルカンパニーから、『バンブレイブ バンブレイバーン』のDXブレイバーンの素晴らしいアクションフィギュアが登場！アニメのアクション満載の瞬間を捉えるために完全可動式で、パーツの交換なしにブレイバーン形態からブレイブサンダー形態への変形が可能です！4種類の顔パーツが含まれており、バーンブレードとバーンアックスを装備しています。バーンブレードのブレイズアップエフェクトパーツも付属しており、交換可能な手もあります。豊かな色彩を実現するために、透明パーツも使用されています。今すぐ注文してください！

"Translate this product description into English"



Good Smile Company brings us an awesome action figure of DX Bravern from "Bang Brave Bang Bravern"! He's fully posable to capture action-packed moments from the anime, and he can transform from his Bravern form to the Brave Thunder form without parts replacement! Four face plates are included, and he's armed with the Burn Blade and Burn Axe; a Burn Blade Blaze Up effect part is included, as are interchangeable hands. Translucent parts are used for a richly colorful appearance, too. Order yours today!

Solving eCommerce's problems with LLMs

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Content generation

- Building upon the previous two applications, we can leverage the **multimodal** and **multilingual generative** capabilities of LLMs to generate new or enhance existing product descriptions and even images.
- Prompt changes can allow for variations in **voice**, **style**, and **expressiveness** to match the store's brand and marketing goals.
- Social commerce marketing calls for a large volume of **original content** to post, which can be automated by LLMs.

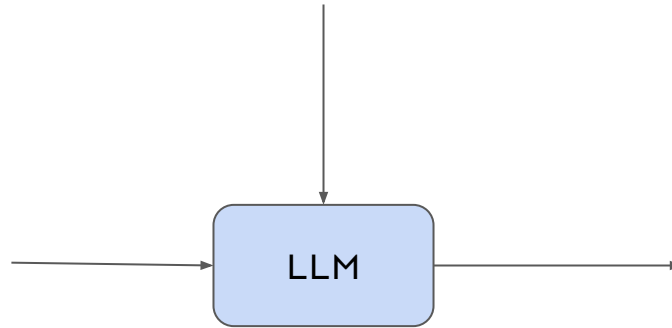
Content generation



Name: Two piece chaise patio love seat set

Description: This outdoor patio set is perfect for all seasons and waterproof for rainy weather. It's perfect for hosting outdoor bbqs, reading a nice book on a sunny day, or watching the kids play in the back yard. It's very durable, affordable, and comes with fast shipping. Dimensions: 74" W x 26.38" H x 48.43"

"Rewrite the product description to optimize for SEO, and also convey the values of quality, style, and value"



Planning a party, or just want some extra seating for the summer? This is the perfect outdoor chaise set. The durable wicker weave construction of the seating area has been designed for all seasons, giving you a comfortable spot for entertaining guests during spring and summer months, then a cozy place to relax in the falling temperatures during fall and winter. Enjoy BBQs, a good book, or watching your kids play from your new favorite spot.

Content generation

- LLMs can also be used to edit and generate images. By incorporating real product imagery with AI generated backgrounds and settings, LLMs can enhance the shopping experience by providing more engaging imagery.
- The imagery can also be tailored for different seasons, trends, and even personalized to the preferences of individual shoppers.



(a)



(b)



(c)

Content generation

- In the new mobile and social eCommerce world, **content** is what gets people **engaged** with your brand, and ultimately brings shoppers into your store.
- LLMs can be used to generate everything from **blog posts** to **short videos**, with interesting **topics** (best of lists, recipes, reviews, how-to guides) that can get potential shoppers to **engage** and lead to **conversion**.



UX

Solving eCommerce's problems with LLMs

Content

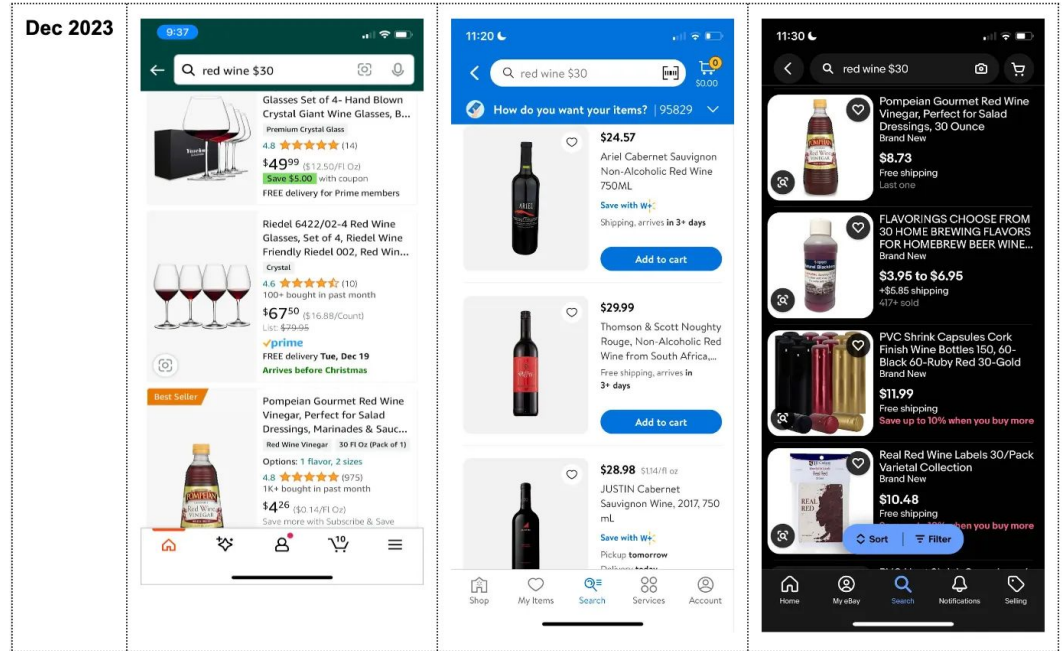
- Data normalization
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UX

- **Semantic search**
- Conversational discovery
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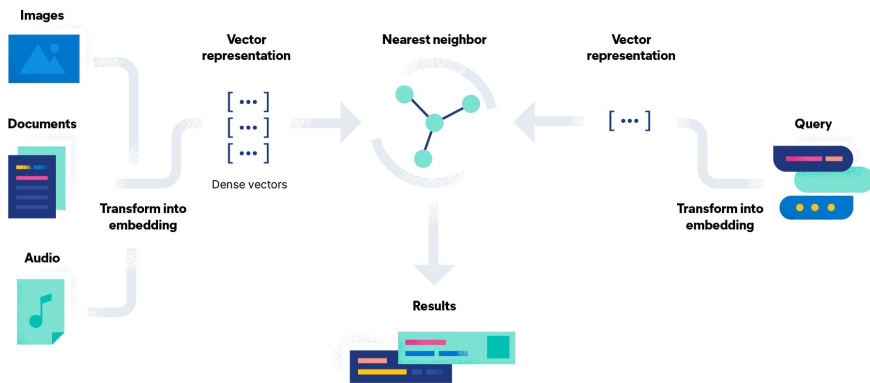
Semantic Search

- By using LLM's and embeddings of natural language queries, we can search for products not just by keywords, but by the semantic relatedness of products to what's expressed by the query.



Semantic Search

- A number of Vector DB platforms have emerged that offer search capabilities for vector embeddings.
- Many keyword-based search engines like ElasticSearch, Vespa, and Algolia now offer vector and hybrid search.
- Embeddings can come from a number of open-source and commercial models, like OpenAI, Huggingface, and so on.



Semantic Search

BODEN

NEW DRESSES WOMEN GIRLS BOYS BABY & TODDLER SALE



Home / Search results for "outfit for job interview"

Search results for "outfit for job interview"

510 items Department ▾ Category ▾ Type ▾ Sleeve Length ▾ Color ▾ Pattern ▾ Price ▾

Sort by: Relevancy ▾



Solving eCommerce's problems with LLMs

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- **Conversational discovery**
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Conversational discovery

- Since ChatGPT, conversational “**chatbot**” interfaces have been **hyped** as the next big thing in eCommerce discovery. Many major retailers have launched a conversational shopping assistant feature, but we are **still in the early stages**.
- LLMs offer not just semantic search, but also **multi-turn, interactive** product discovery, with a UX that is familiar to mobile text messaging app users.
- Challenges:
 - Balancing the accuracy of search with the inspiration of generative AI.
 - Safely handling non product-related queries (customer support, discounts, spam/abuse).
 - Shift in user behavior will take time

Conversational discovery

I'm going on a long flight, I need things to keep me comfortable on the plane.

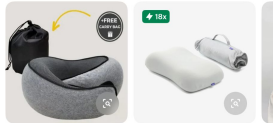
shop

Of course! I can help you find some comfortable items for your long flight. What specifically are you looking for? Are you interested in travel pillows, blankets, or any other specific items? Let me know so I can assist you better!

Like Dislike

Travel pillows

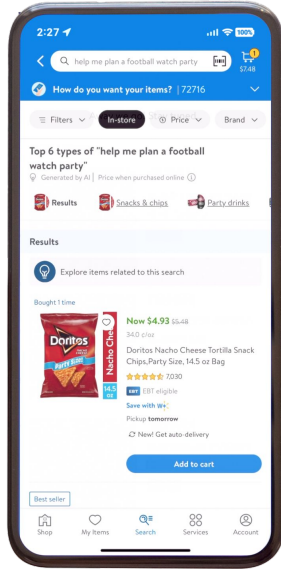
I found some travel pillows that might be perfect for your long flight. They come in different styles and price ranges. Are you looking for a specific type of travel pillow, such as a neck pillow or an inflatable pillow? Let me know your preference so I can provide you with more specific recommendations!



SLEEP NOVA
NOVA™ Travel Neck Pillow
\$39.95 \$89.00

Cushion Lab
Travel Deep Sleep Pillow
\$95.00 \$185.00
\$76.10 with your offer

Like Dislike



help me plan a football watch party

How do you want your items? | 7/27/16

Filters: Instone Price Brand

Top 6 types of "help me plan a football watch party"

Generated by AI | Price when purchased online

Results: Snacks & chips Party drinks

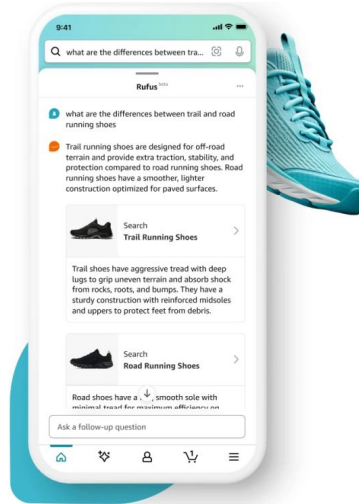
Explore items related to this search

Bought 1 time

Doritos Doritos Nacho Cheese Tortilla Snack Chips, Party Size, 14.5 oz Bag
Now \$4.93 (was \$4.00)
4.5 stars 7030
Free engine
Save with W+
Pick-up tomorrow
Need Get auto-delivery

Add to cart

Shop My items Search Services Account



what are the differences between tra... | Rufus

what are the differences between trail and road running shoes

Trail running shoes are designed for off-road terrain and provide extra traction, stability, and protection compared to road running shoes. Road running shoes have a smoother, lighter construction optimized for paved surfaces.

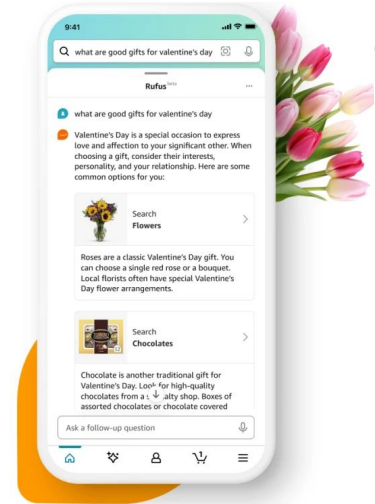
Search Trail Running Shoes

Trail shoes have aggressive tread with deep lugs to grip uneven terrain and absorb shock from rocks, roots, and bumps. They have a sturdy construction with reinforced midsoles and uppers to protect feet from debris.

Search Road Running Shoes

Road shoes have a smooth sole with minimal tread for maximum efficiency on

Ask a follow-up question



what are good gifts for valentine's day | Rufus

what are good gifts for valentine's day

Valentine's Day is a special occasion to express love and affection to your significant other. When choosing a gift, consider their interests, personality, and your relationship. Here are some common options for you:

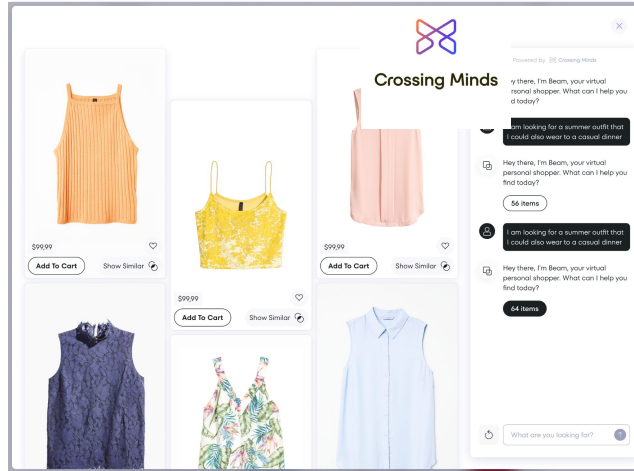
Search Flowers

Roses are a classic Valentine's Day gift. You can choose a single red rose or a bouquet. Local florists often have special Valentine's Day flower arrangements.

Search Chocolates

Chocolate is another traditional gift for Valentine's Day. Look for high-quality chocolates from a specialty shop. Boxes of assorted chocolates or chocolate covered

Ask a follow-up question



Crossing Minds

Powered by AI Crossing Minds

Hey there, I'm Beam, your virtual personal shopper. What can I help you find today?

Are you looking for a summer outfit that could also wear to a casual dinner?

56 Items

Are you looking for a summer outfit that could also wear to a casual dinner?

64 Items

What are you looking for?

Solving eCommerce's problems with LLMs

Content

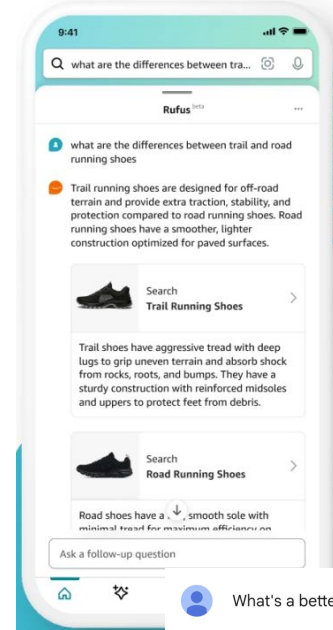
- Data normalization
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- **Product research and comparison**
- Customer support

Product research and comparison

- An important part of the shopping process is doing **research** and **comparisons**.
- An LLM can help customers make buying decisions by **summarizing** and **comparing** the important qualities of products.



Show drafts  

- ◆ Choosing between the Polygon T7 and Marin Rift Zone 2 for a 12 year old boy depends on a few factors:
 - **Wheel size:** The T7 has 29er wheels, which might be too big for a 12 year old. The Rift Zone 2 comes with 27.5in wheels, a better fit for most 12 year olds.
 - **Brand reputation:** Both are good brands, but Marin might have slightly better brand recognition.
 - **Components:** Look into the specific components, like shifters, derailleurs, brakes, and suspension forks. While the T7 might have a slight edge with a dropper post (useful for descents), see if the Rift Zone 2 has components from reputable brands like Shimano or SRAM.

Solving eCommerce's problems with LLMs

Content

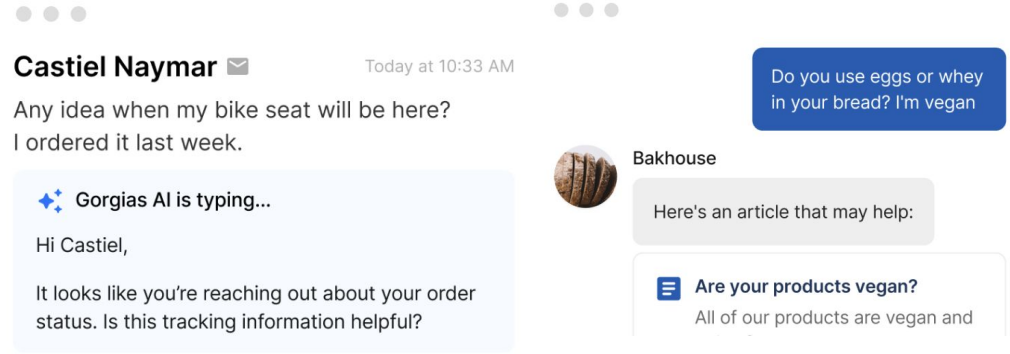
- Data normalization
- Image tagging
- SEO
- Translation
- Content generation

UX

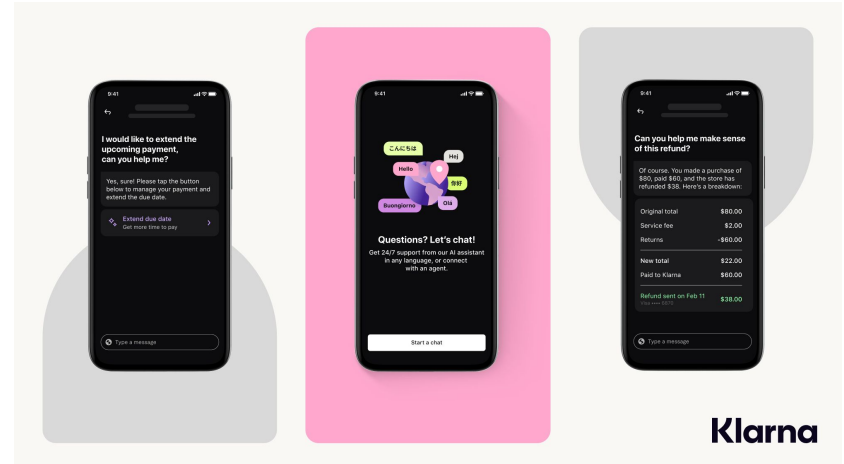
- Semantic search
- Conversational discovery
- Product research and comparison
- **Customer support**

Customer support

- Customer support is a costly, labor-intensive feature that is hard to offer 24/7.
- LLM-based Customer Support can reliably offer assistance for common requests around the clock, giving a better customer experience.
- Klarna recently [announced](#) that their AI Assistant is handling two-thirds of their customer service chats, resolving issues 5x faster, and will drive \$40M in profits in 2024.



 gorgias



Solving eCommerce's problems with LLMs

Content

- Data normalization
- Image tagging
- SEO
- Translation
- Content generation

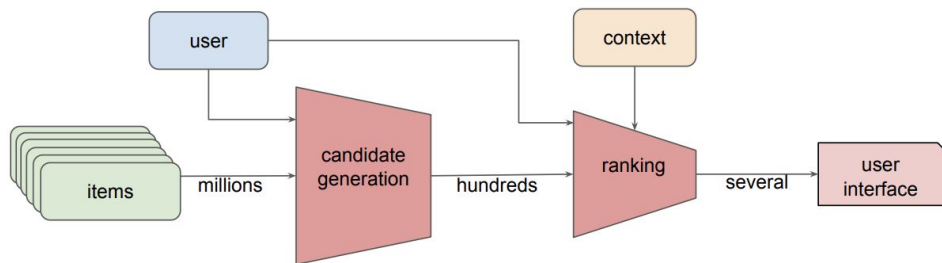
UX

- Semantic search
- Conversational discovery
- Customer support

What about recommendations?

What are recommendations?

- “Recommendation” is generally defined as the prediction of **items relevant to a given user and/or seed item**, with no explicit context (i.e. queryless).
- Typical recommender systems (RecSys) utilize a two-stage architecture of **candidate generation** then **ranking** to return the best results.



Can LLMs do recommendations?

- LLMs' out-of-the-box ability to make cultural associations allow them to generate good recommendations, with some big caveats:
 - The **user representation** must be fed into the prompt directly
 - They cannot constrain results to a **specific catalog** of recommendable items
 - There may be **blind spots** in lesser-known or more recently released products



You

I loved watching Poor Things, what are other movies I should watch on Netflix?



ChatGPT

If you enjoyed "Poor Things," you might like to explore a range of similar movies that blend elements of dark comedy, fantasy, and unique narrative styles. Some recommendations include "Pity" (2018) for its exploration of a man addicted to sympathy in bizarre circumstances, "Voyagers" (2021) for its thematic elements of dystopian future and genetic manipulation, "Attenberg" (2010) for its focus on human relationships and societal norms, and "Coraline" (2009), which delves into alternate realities and the exploration of unconventional worlds. Each of these films shares thematic or stylistic similarities with "Poor Things," offering unique and thought-provoking cinematic experiences [1].

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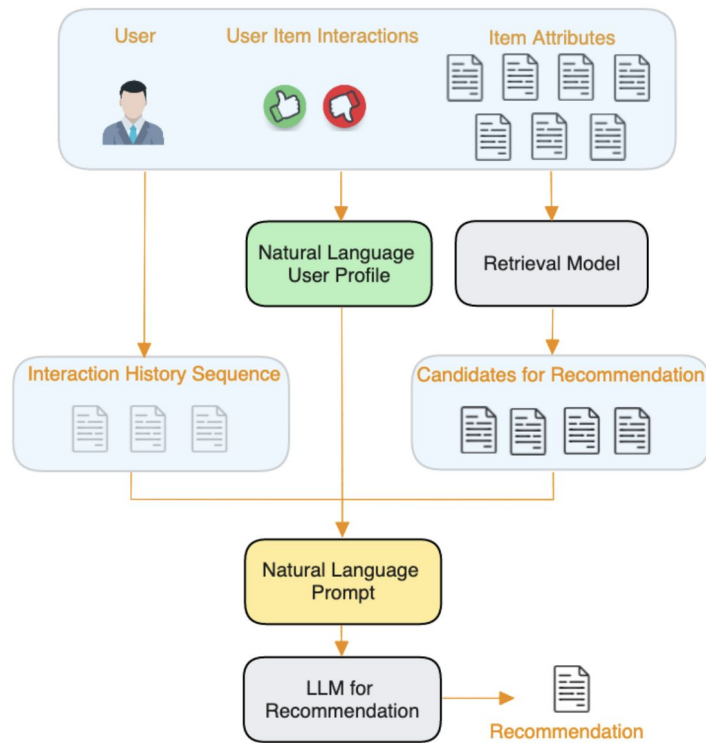
If you enjoyed "Poor Things," you might like to explore a range of similar movies that blend elements of dark comedy, fantasy, and unique narrative styles. Some recommendations include "~~Blade Runner~~" (2018) for its exploration of a man addicted to sympathy in bizarre circumstances, "Voyagers" (2021) for its thematic elements of dystopian future and genetic manipulation, "Attention" (2010) for its focus on human relationships and societal norms, and "~~Cube~~ Cube" (2009), which delves into alternate realities and the exploration of unconventional worlds. Each of these films shares thematic or stylistic similarities with "Poor Things," offering unique and thought-provoking cinematic experiences [1].



Good recommendations,
not available on Netflix

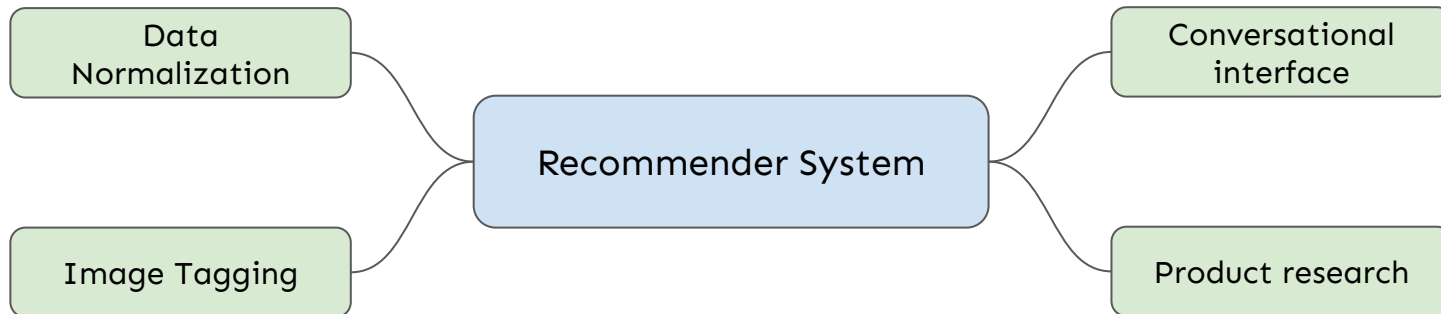
Building a better LLM recommender for eCommerce

- Using **RAG** can help address the catalog constraints.
- Significant **prompt engineering** is still needed to encode the user interaction history and profile into the prompt.
- But this then becomes almost a classical two-stage recommender system, with RAG as the candidate generation, and LLM assuming the **ranking** role.



Using LLMs to augment RecSys, and not replace them

- The benefits of LLMs are much more obvious as **surrounding components** to **enhance** a standard RecSys than they are as a straight replacement.



Summary - Many applications of LLMs for eCommerce

Content

- Data normalization
- Image tagging
- SEO
- Translation
- Content generation

RecSys

UX

- Semantic search
- Conversational discovery
- Product research and comparison
- Customer support

Thank You!