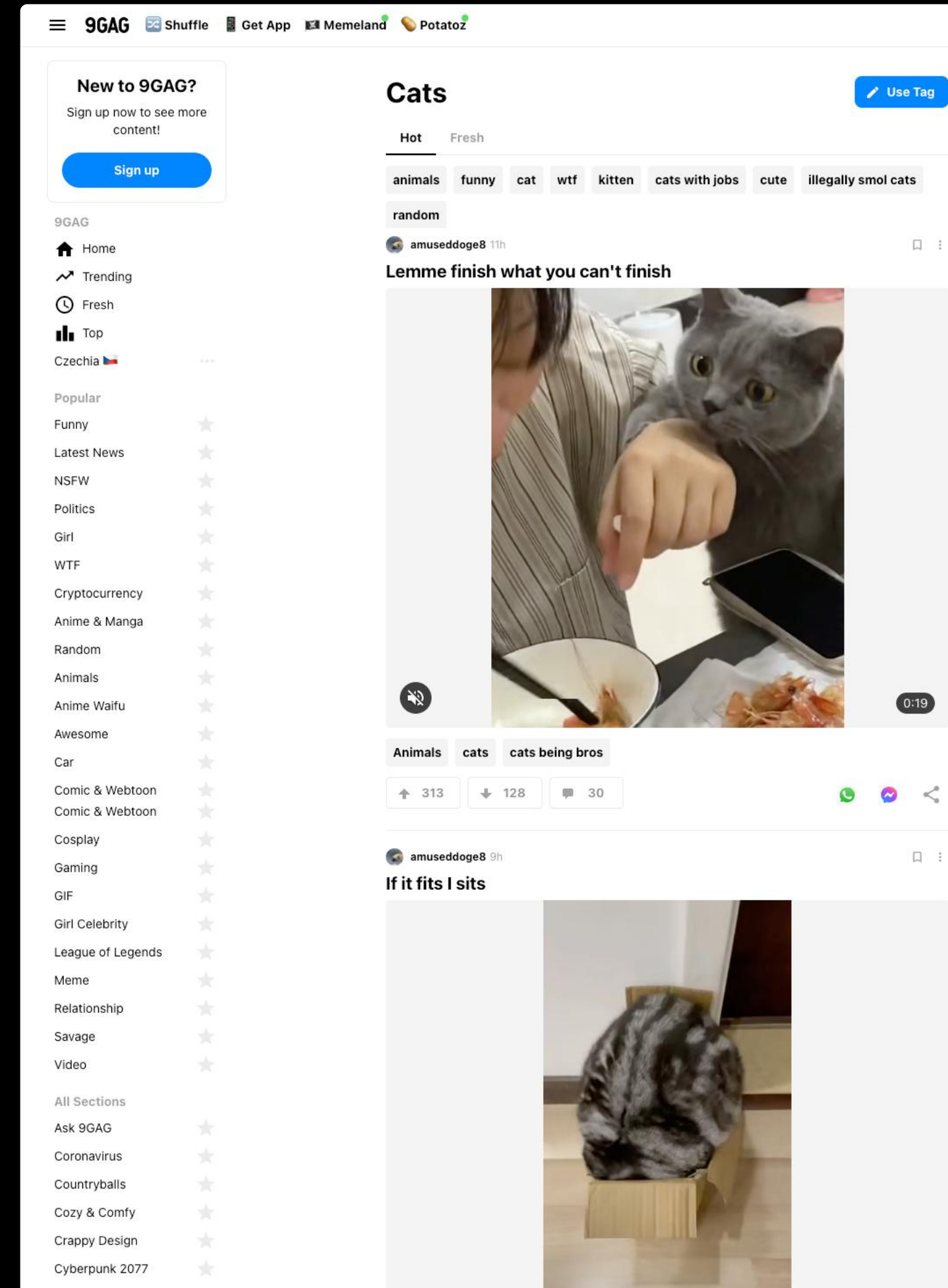


9GAG Success Story With Recombee

# Real-time User Generated Content Personalization for a Global Entertainment Giant

Cross-Platform Entertainment Network

Content Recommendations



## Recombee & 9GAG Collaboration

**9GAG is a global cross-platform entertainment network with 200+ million audiences worldwide.**

Ranked #1 in cross-platform video creation in the US, 9GAG distributes 8.4 billion video views and 3.5 billion page views monthly through all platforms.

Recombee's smart content recommendations helped 9GAG to fully personalize their homepage infinite scroll to increase multiple KPIs, including post views, the overall number of interactions, and total session duration of all active registered users.

Recombee's recommender engine brought a significant increase also in user engagement as well as overall satisfaction.

**37% increase**

In post views

**22% more**

Of overall interactions

**7.5% higher**

Users' session duration

**2.8% increase**

In the number of visits

# 9GAG

## The Largest Meme Community

9GAG started in 2008 as a site for hosting and distributing funny pictures and videos. Back then, social networks like Facebook or Twitter were on the rise, and people would use them to share the user-generated content they found on 9GAG.

9GAG introduced the revolutionary infinite scroll in 2012.

Today, the global entertainment giant has more than **40 million registered users** worldwide, making it the largest meme community on the internet.

### Meme

Use Tag

Hot Fresh

funny wtf surreal meme random memes 9gag india politics lol

9GAGGER 1h

Last thursday, somewhere in Ireland



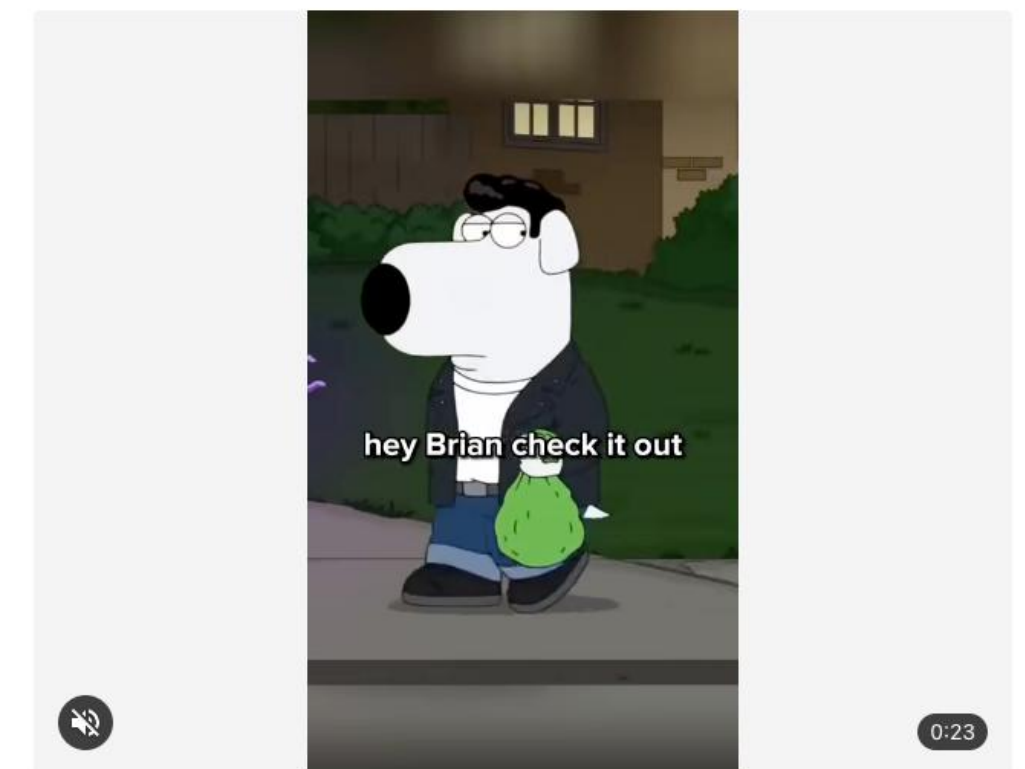
Meme

561 65 90

Facebook Pinterest

zentama87 3h

Killer costume meme



Funny family guy omg meme

3.2K 275 87

Facebook Pinterest

roninranger 5h

Which one were you? I was 0.7mm



## Situation

Hundreds of millions of monthly post views and other interactions

Millions of heavy users visiting the site very frequently, always looking for something new

Huge catalog of continuously growing user-generated content

In-house recommender system for personalized feeds

## Requirements

A solution capable of replacing the current Home infinite feed under high traffic and minimal response time

Instant recommendation of newly added posts

Comprehensive set of business requirements to ensure compatibility with the current feed

Incremental model learning with constantly incoming interaction, text, and image data

Ensuring that every user sees a brand new feed whenever they return to the page

Development of a custom recommendation logic that exactly matches 9GAG's product vision and expectations.

## **Complex and diverse ensemble of incrementally-trained recommendation models.**

### **Collaborative Filtering**

### **Content-Based**

Utilizing latest deep-learning approaches

NLP of titles and meme OCRs

Image processing of both static memes and sampled video frames

### **Reinforcement Learning (Contextual Bandits)**

Optimization for **multiple complex user engagement KPIs** including the number of interactions, total visits, total session duration, retention rate, and other metrics.

Delivery of recommendations in 50ms on average.

## Challenges of the User-Generated Content

Users are **continuously adding new posts** to 9GAG's platform, so to achieve high-quality personalization, the recommendation system must be able to process them instantly.

Newly added posts must **gain immediate traction** by being recommended to the right users through either similarity of visual/textual content or first interactions received.

Traditional recommender systems that utilize a standalone "model training phase" cannot handle such situation well, because when the batch training of traditional recsys model is finished, the model is already obsolete.

Recombee's unique technology of **online and incremental model training** is designed to ensure smooth personalization for huge and ever-growing catalogs.

In combination with reinforcement learning, Recombee can also **identify and promote "hidden gems"**, which is critical for any social network.

## Infinite Scroll Personalization

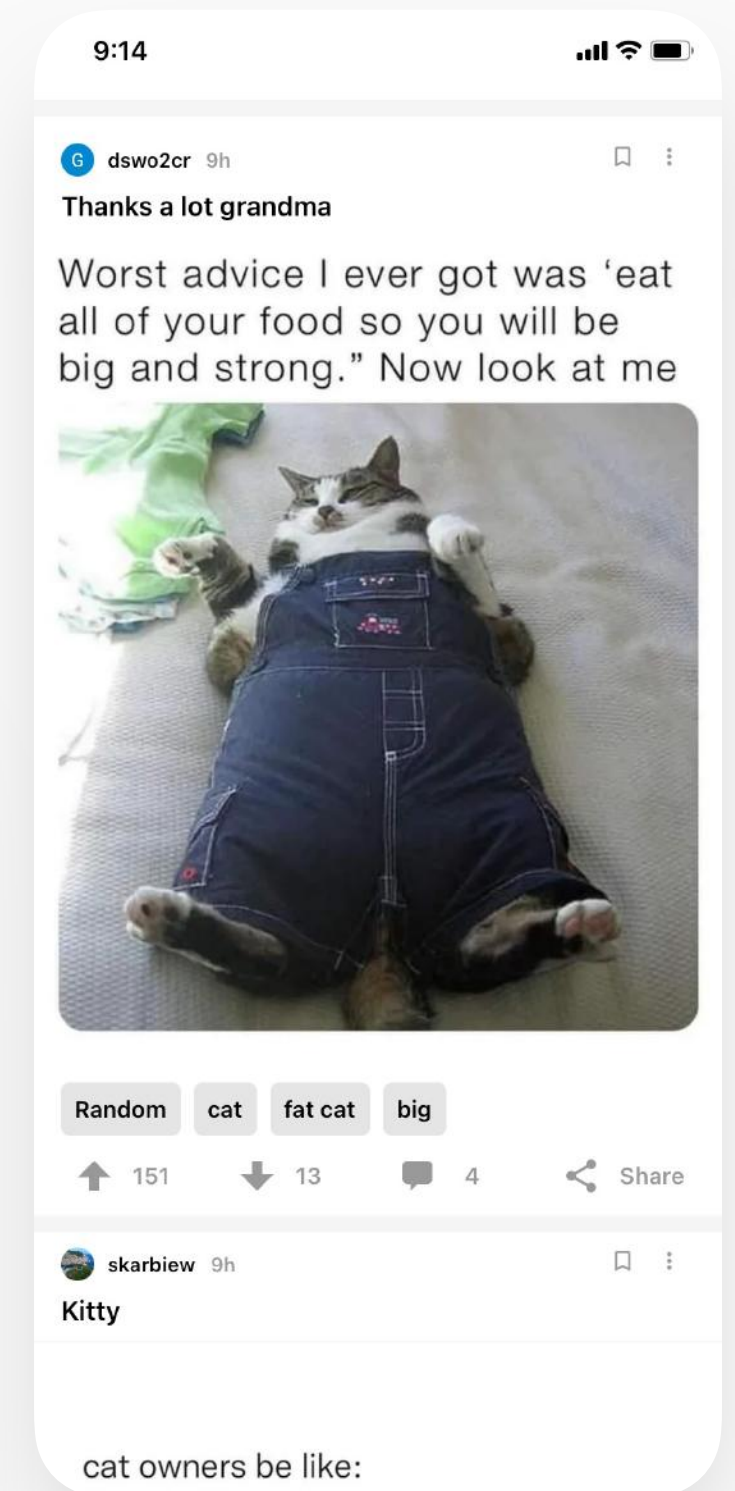
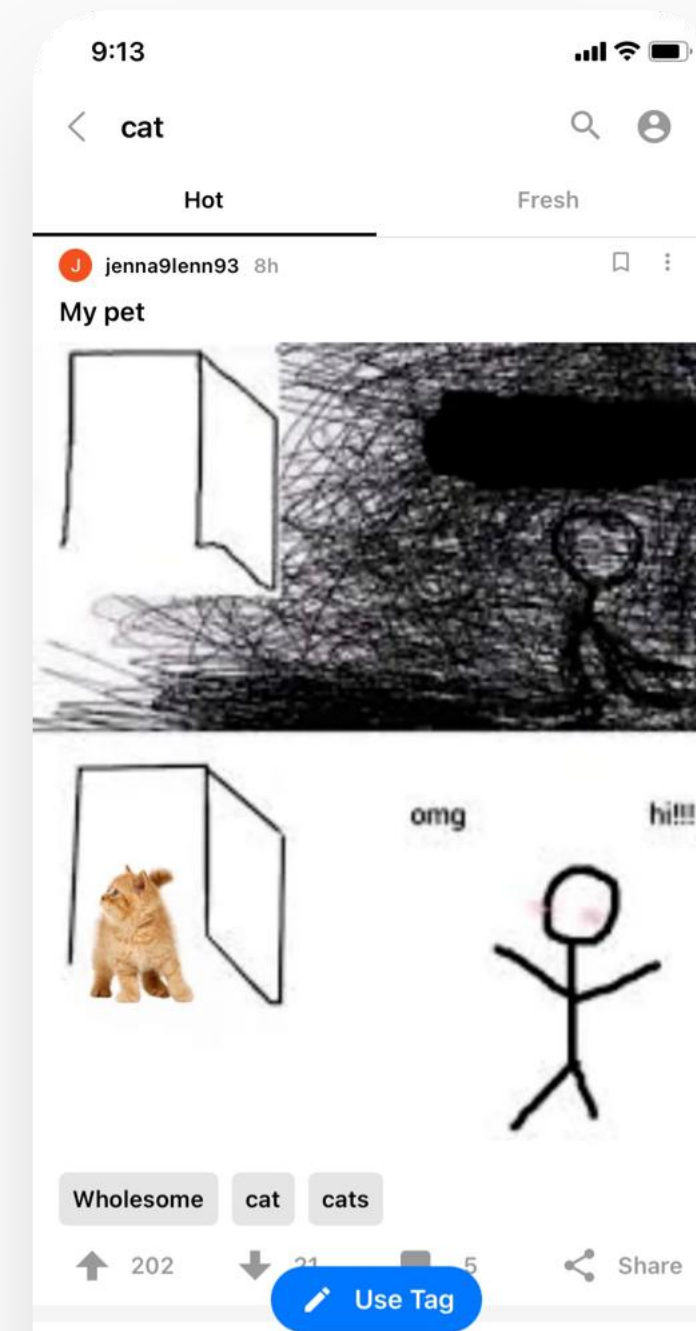
To let its users flow through the extensive amount of continuously growing content with no boundaries, 9GAG deployed Recombee's Infinite Scroll.

The feature allows users to infinitely scroll through auto-generated recommendations without switching to new tabs, providing the infinite feed for any screen width and autoloading the personalized recommendations in real-time on a mere scroll.

Continuous delivery of personalized content as users scroll down

Bottomless browsing experience with automated feed

Great user experience, especially for touchscreens on e.g., mobile devices



## “Hot Feed” (“Home Feed”)

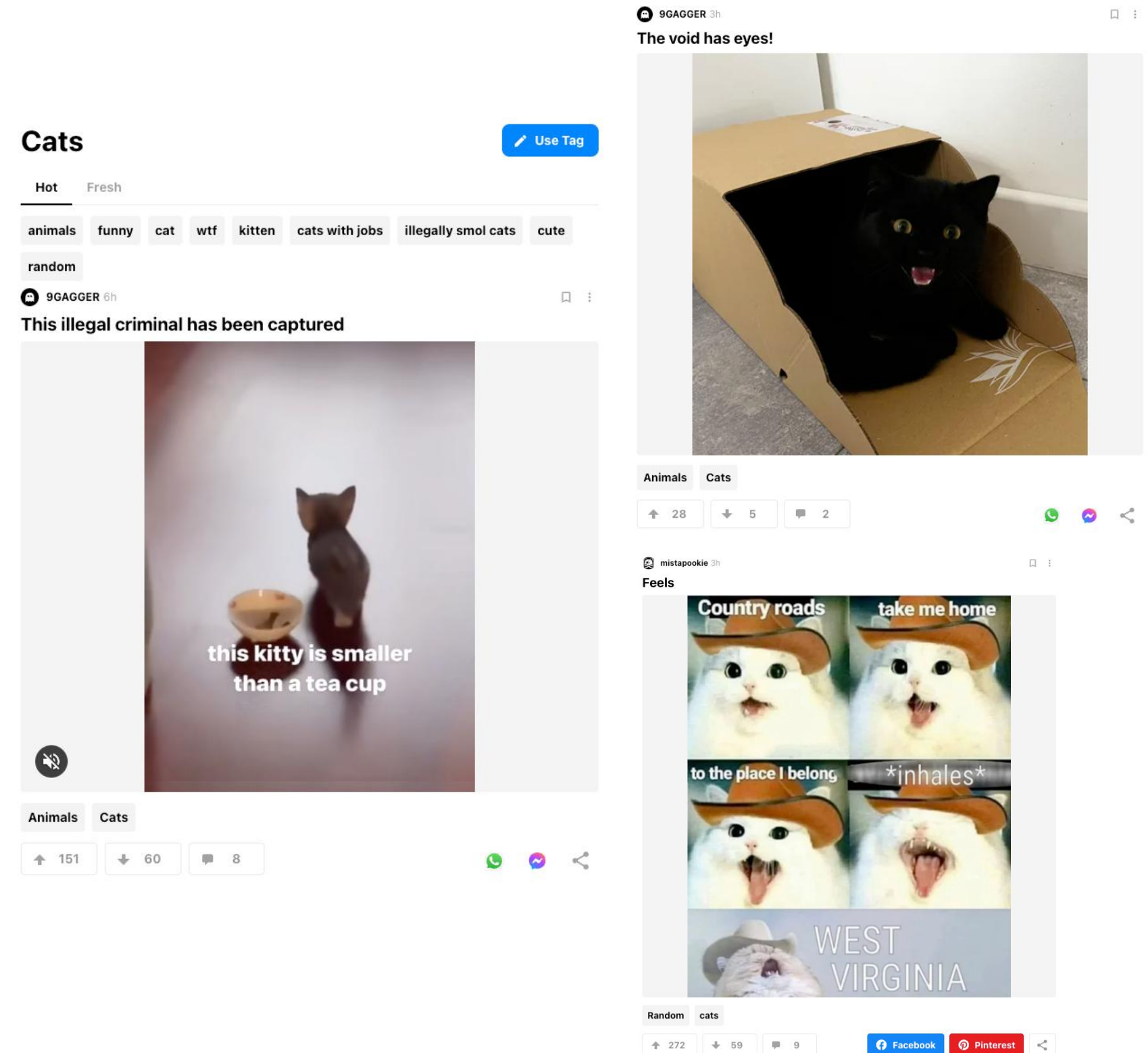
Content recommendations

Recombee was tested in an **extensive A/B test** directly on the user's **Home feed**, which is the main place where users consume most content.

The A/B test ran for over **50 days** and looked at a range of metrics, including those measuring the **long-term impact of Recombee** on the Home feed.

Recombee has been convincingly proven to optimize not only immediate engagement (CTR, upvotes, session duration) but also **long-term user retention and frequency of visits**.

Based on the test results, Recombee now powers **100% of the Home feeds** of all active registered users.



 **Items to User**  
Recommendation Type

 **9gag:personal**  
Recommendation Logic



## Improvements Thanks to Recombee

### Home Feed Interactions

**+22% More Overall**

- +37% Post Views
- +15% Post Saves
- +5% Post Shares
- +14% Post Upvotes
- 4% Post Downvotes

### Home Feed Sessions

- +3%** Number of Sessions
- +7.5%** Total Session Duration of all Users
- +4%** Average Session Duration

### Visits

- +2.8%** Number of Total Visits
- +1.5%** Number of Unique Visitors

### ↑ User Engagement

- More Clicks, Comments, Upvotes
- Less Downvotes
- Longer Sessions

### ↑ User Retention

- More Visiting Users
- Increased Frequency of Visits
- Higher Total Time Spent



“Daily traffic to the 9GAG site amounts to **hundreds of millions of users worldwide**. To provide a **unique user experience** for each and every one of them, we needed to implement a recommendation system that would allow for the most advanced, real-time personalization of their experience. So we chose Recombee. Thanks to their solution, we managed to increase, among other KPIs, **post views by 37%, overall interactions by 22%, and users’ session duration by 7.5%**. With Recombee, we've taken engagement with user-generated content to the next level.”

**Kristie Chen**, Product Head at 9GAG



"Why waste time and money on the development of your own recommender system, if you can use the most advanced engine tailored by data scientists."

Excellent **scalability, big data infrastructure**

**Universal SaaS solution** verified on **multiple verticals**

**Real time** machine learning

**Simple and intuitive API + SDKs** for easy integration

**Research and improvements** on sophisticated algorithms and AI

**Graphical user interface for monitoring KPIs**



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