

AMENDED Exhibit 1155

PLAINTIFFS' OMNIBUS OPPOSITION TO DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT

Case No.: 4:22-md-03047-YGR

MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

Stories Ranking 101

@stories-cqr-team 3/1/2022

CONFIDENTIAL

HIGHLY CONFIDENTIAL (COMPETITOR)

SNAP2857687



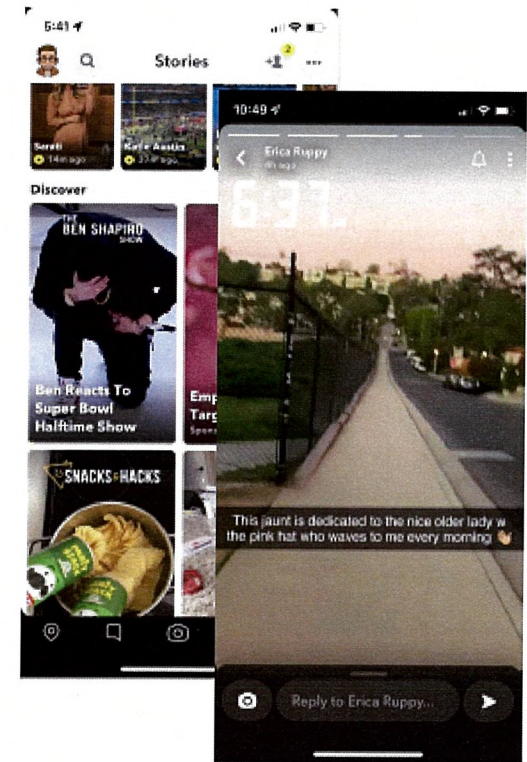
What is Stories Ranking?

1

Mission: Make it easy for Snapchatters to discover content that inspires them to live in the moment, learn about the world, and have fun together

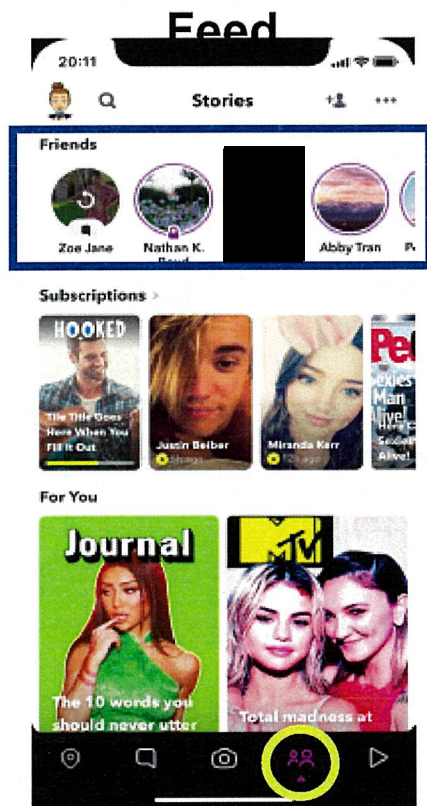
2

How: Suggest the right stories in the right moment

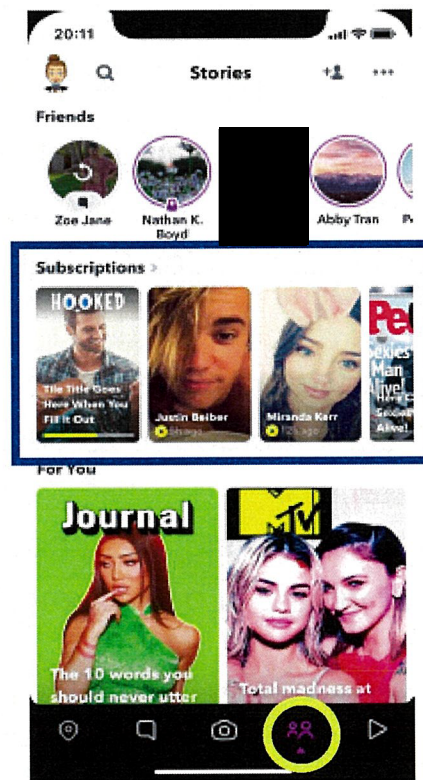


Where Do We Rank Stories?

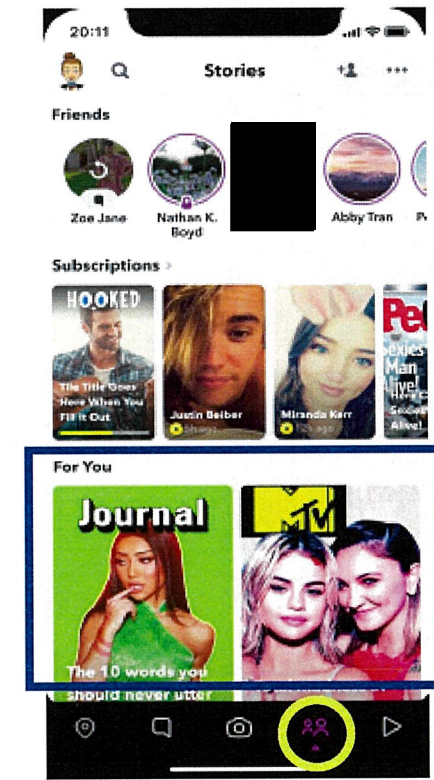
Stories Tab Friends



Subscriptions



Discover / For You



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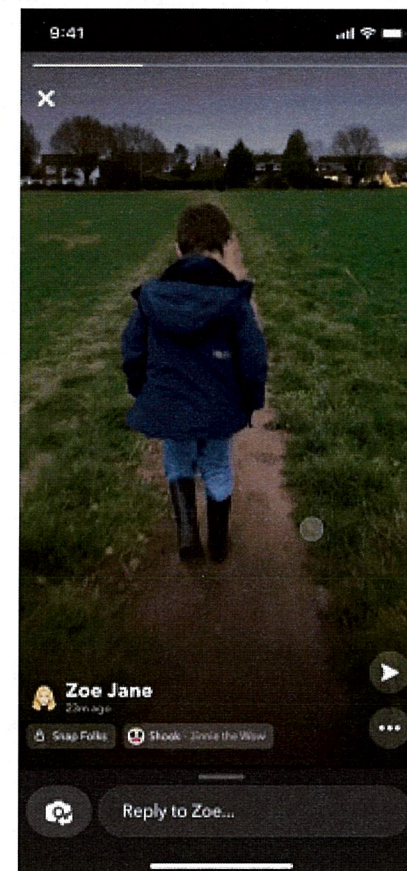
Why is Stories Ranking Important?

Increasing user engagement with the Stories tab is critical for our business -

One of Snap's primary levers for growing engagement is Stories Ranking, which makes it easy for users to find content they enjoy and care about

When users are shown stories they want to deeply engage with (e.g., reply, share), it inspires them, their friends, creators, and publishers to post more stories, spinning the Stories flywheel faster

Every change to our stories ranking logic is tested in A/B experiments to quantify the incremental impact on key engagement metrics such as *Stories View Time*, *Stories Viewers*, and *Stories Replies*



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Four Types of Considerations Influence Story Suggestions

- **Personalization**

- Within each section in the Stories tab, stories are ranked by their relevance for the user

Focus of this presentation

- **Quality & Diversity (Discover only)**

- Top ranked stories can get reordered to limit the volume of suggestive/shocking content, improve quality, diversify the feed, and ensure fresh content

- **Manual Curation (Discover only)**

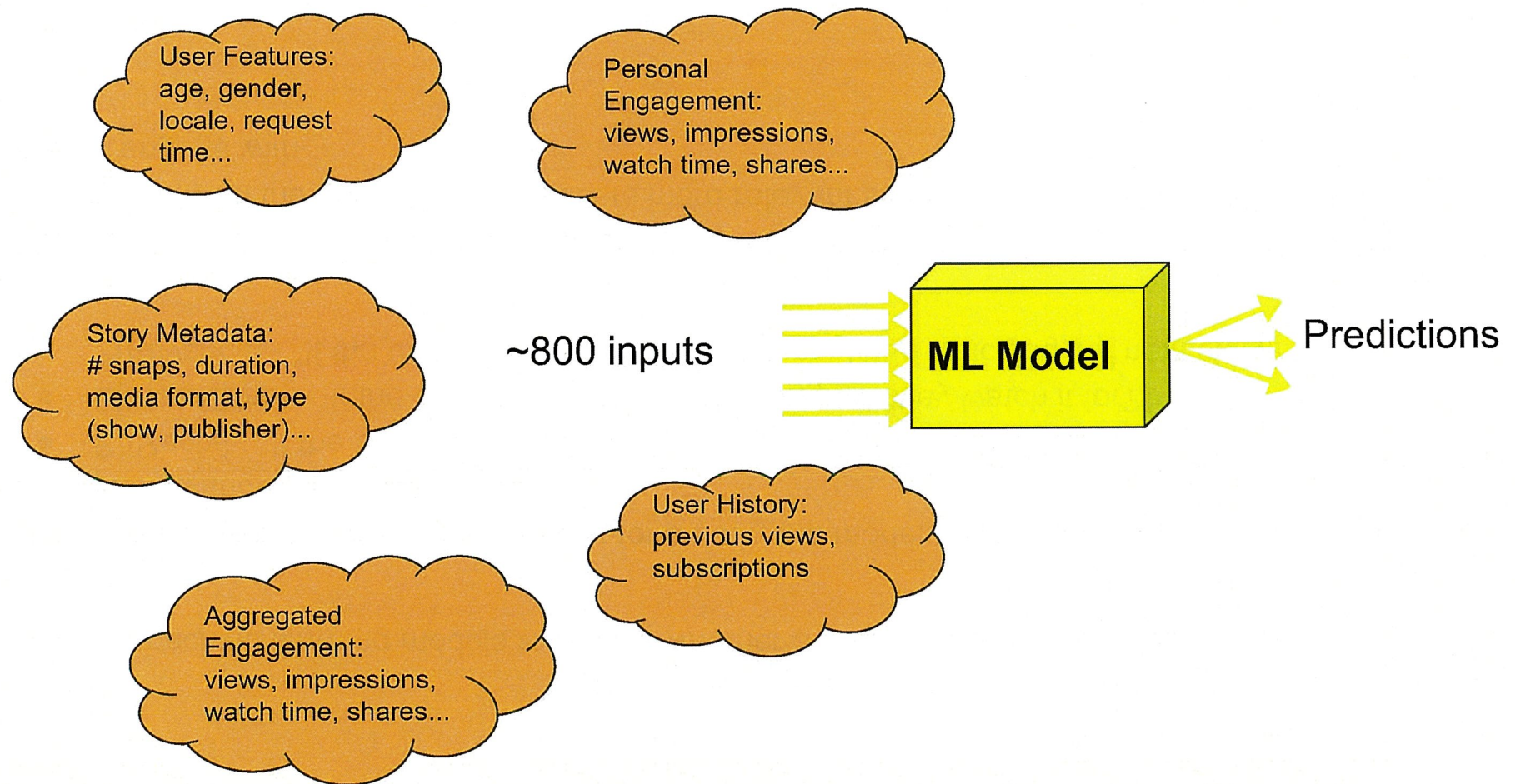
- Automated ordering can be partially overridden to promote high-priority content ([learn more](#))

- **Story Ads (Discover only)**

- Some recommendations can get pushed down by sponsored stories ([learn more](#))

Personalization: Identifying the Most Relevant Stories for Every User





Predicting the Future

We use machine learning models to predict whether a user would be interested in a particular story

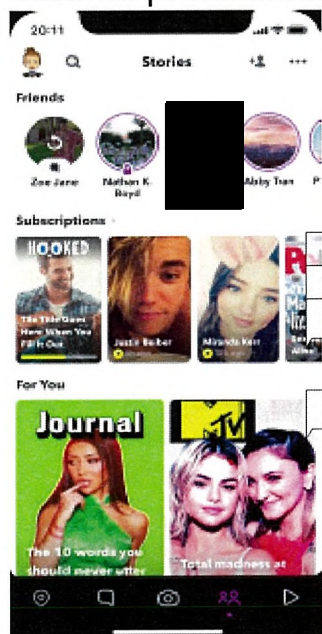
To determine whether a story is relevant for a user, the models predict the likelihood of a user completing various actions, such as:

- $P[\text{Reply}]$ - “If the user watches this story from their friend, will they reply?”
- $E[\text{View Time}]$ - “If the user watches this, how long will they watch it for?”
- $P[\text{Advance}]$ - “If the user watches this, will they continue watching the next story?”

Many of the changes we test in A/B experiments are attempts at improving the accuracy of our predictions, with the goal of showing users more relevant story suggestions they will want to deeply engage with

Scoring Stories by Relevance

To find the most relevant and engaging stories for each user, we use [utility functions](#)¹ that combine the various predictions into a single score. Each story is scored independently of other candidate stories



$$1. [\text{Friends Story Score}] = 1.0 * p(\text{view}) + 15.0 * p(\text{reply}) + 1.0 * E(\text{cdf}^2 \text{ view time}) + 0.9 * E(\text{complete ratio}) + 150 * p(\text{share})$$

$$[\text{Subs Story Score}] = 0.65 * E(\text{view time}) + 23 * p(\text{long watch}) + 25 * p(\text{complete}) + 0.95 * p(\text{tap premium content}) + 5 * p(\text{advance}) - 90 * p(\text{unsubscribe})$$

$$3. \text{En: } [\text{Discover Story Score}] = 0.7 * E(\text{view time}) + 46.2 * p(\text{long watch}) + 18.9 * p(\text{complete}) + 38.2 * p(\text{subscribe}) + 350 * p(\text{send}) - 160 * p(\text{hide}) - 64000 * p(\text{in-app report}) + 0.46 * E(\text{premium view time}) - 7.7 * p(\text{tap premium content}) - 106 * p(\text{hide})$$

¹ Note: this slide displays the Stories functions that are in production as of 3/7/22. For the most up to date info on our utility functions, see [this wiki](#)

² 'Cumulative Distribution Function' which normalizes view time to be between 0 and 1

Slide 9 Comments

- 1 is this p(tap)E(view time|tap) or view time estimation independent of tap?
[REDACTED] 12/20/2022 06:15 PM
- 2 What's the definition of "long watch"?
[REDACTED], 5/3/2022 01:59 PM
- 3 5+ sec. @ [REDACTED] to confirm
[REDACTED] 5/3/2022 01:59 PM
- 4 Is there no weight to p(send) for subs?
Josh Siegel, 5/3/2022 01:58 PM
- 5 Good catch. Not according to our documentation.

@ [REDACTED] is the documentation accurate, and if so what is the rationale?
[REDACTED] 3/15/2022 09:11 PM
- 6 @ [REDACTED] thoughts on this?
[REDACTED] 5/3/2022 01:58 PM

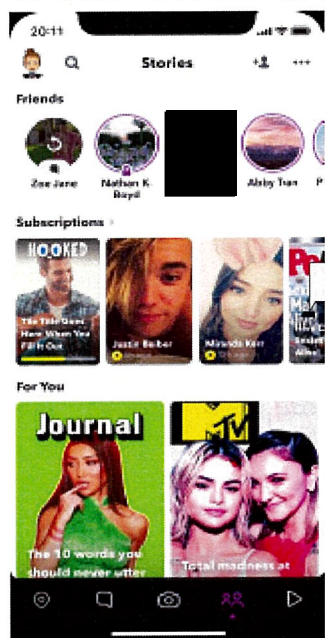
Slide 9 Comments (Continued)

7 Same thing as p(share)?
Josh Siegel, 5/3/2022 01:59 PM

8 @ [REDACTED] ?
[REDACTED], 5/3/2022 01:59 PM

Customized Story Scoring

'Relevance' is measured differently by each utility function, to account for the unique nuances and objectives of each section in the Stories tab



Different types of user actions are rewarded and penalized in each section

$$1. [\text{Friends Story Score}] = 1.0 * p(\text{view}) + 15.0 * p(\text{reply}) + 1.0 * E(\text{cdf view time}) + 0.9 * E(\text{complete ratio}) + 150 * p(\text{share})$$

$$2. [\text{Subs Story Score}] = 0.65 * E(\text{view time}) + 23 * p(\text{long watch}) + 25 * p(\text{complete}) + 0.95 * p(\text{tap premium content}) + 5 * p(\text{advance}) - 90 * p(\text{unsubscribe})$$

The same user action is weighted differently

$$3. \text{En: } [\text{Discover Story Score}] = 0.7 * E(\text{view time}) + 46.2 * p(\text{long watch}) + 18.9 * p(\text{complete}) + 38.2 * p(\text{subscribe}) + 350 * p(\text{send}) - 160 * p(\text{hide}) - 64000 * p(\text{in-app report}) + 0.46 * E(\text{premium view time}) - 7.7 * p(\text{tap premium content}) - 106 * p(\text{hide})$$

Slide 10 Comments

- 1 @ [REDACTED] - Would you mind updating?
Reassigned to [REDACTED]
[REDACTED] 6/29/2023 05:51 AM
- 2 @ [REDACTED] - Bumping. This is a really useful doc, but i'm pretty sure it out of date
[REDACTED]y, 6/29/2023 05:51 AM

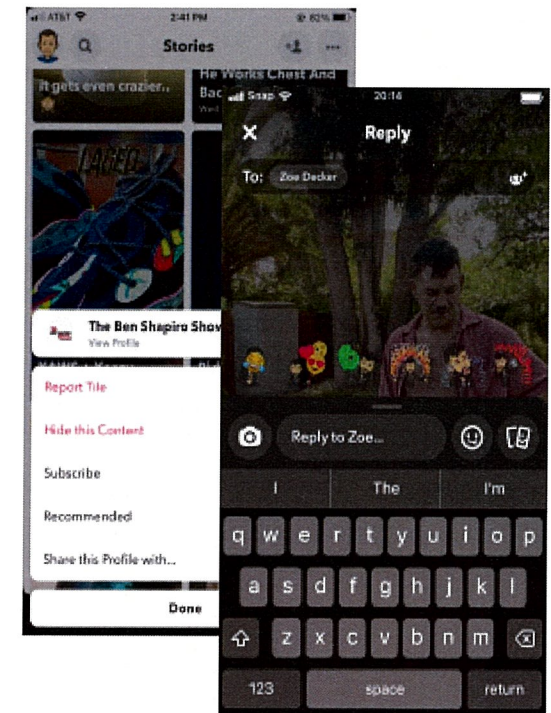
Tweaking and Refining Our Utility Functions

Explicit actions are critical in the utility function to surface stories that elicit positive actions (e.g., *Reply*, *Subscribe*) rather than negative actions that imply user disappointment (e.g., *Report*, *Hide*)

To ensure our utility functions evolve in lockstep with the UX and business priorities of the Stories product, we regularly experiment with the addition/removal of actions (aka heads/terms) and the weights assigned to them

For example:

When auto-advance from Friends to Subs/FY¹ launched in Q4'21, we replaced the *Tap* head with *Long Watch* in the Subs and Discover utility functions, to account for the fact that many users would start to auto-advance into these stories rather than click on their tiles



¹ Automatically advances a user from their last Friends story to their first Subs story, and from the last Subs to the first Discover story