

AMENDED Exhibit 529

PLAINTIFFS' OMNIBUS OPPOSITION TO DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT

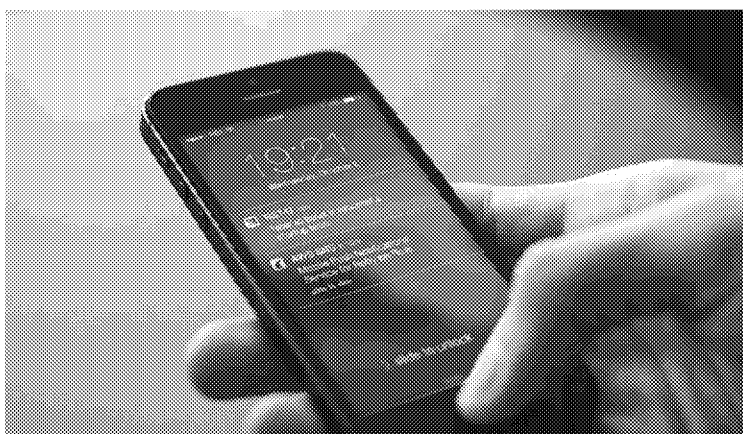
Case No.: 4:22-md-03047-YGR

MDL No. 3047

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

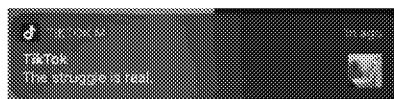
TikTok Push 101 - English Ver.

1. What does push look like?



⚡ ——— TikTok Push Types ——— ⚡

Interest Push

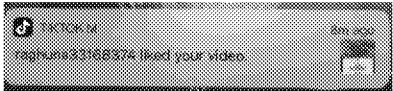


Ops Push - External Push

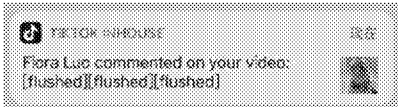
Ops Push - In App Push(only for
livestream)



Like Push



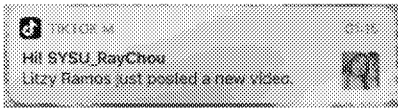
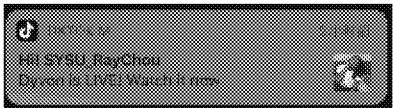
Comment Push



Live Push [HYPERLINK

"https://bytedance.feishu.cn/docs/doccnymhRgPc6vf36mFsolFgmqe" \h]

Post Push

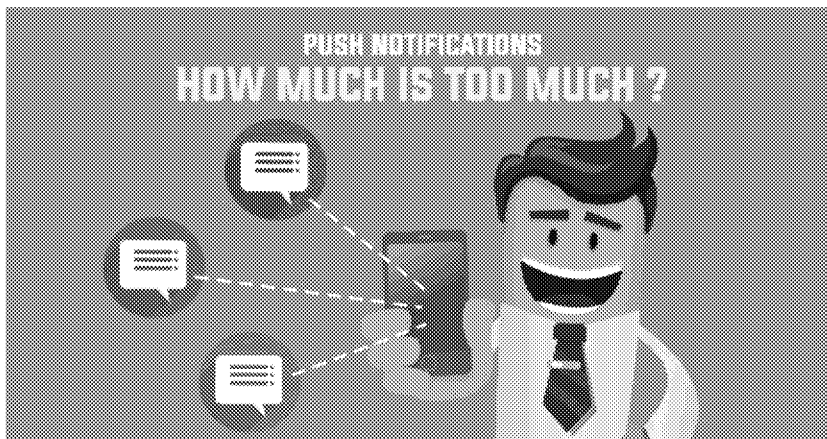


2. Goal of Push

- **Activate & Engage users with the right content at the right time, to encourage users to open the App more and stay longer**

- * **Guide users to consume high-quality app content & Timely access to social information & Timely perception of hotspot & Interest exploration and expression**
- * **Generally speaking, different types of push have different goals:**
 - **Interest Push:** based on "no interest push to daily active users" strategy, the goal is to activate users so they will return to the app
 - **Ops Push:** inform users the trending content on TikTok and encourage video view and creation
 - **Live/Post push:** get live info and new video of the users I followed
 - **Comment/Like and other interactive push:** help users to get interaction message in time and encourage users to keep posting videos

3. How does push affect user experience?



Positive

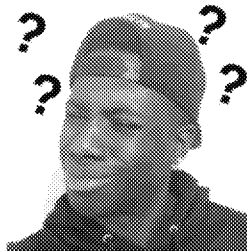
Inform users about important in-app news, trend and messages "related to them", for example:

- * "This week's "6schallenge", come and join us!
- * "@WillSmith posted a new video, check it now."
- * "@BTS left you a comment, check it now."



Negative:

1. Push **at the wrong time** or **too many pushes** will bother users
 - Example: send push to users at 2am or send 88 pushes to users all at once (in reality this won't happen due to the algo policy that keeps push from being sent out during 12pm to 8am)
2. Users are not happy to see push **contents that they are not interested in**
 - Example: sending a push on pets to a user who repeatedly disliked pet videos

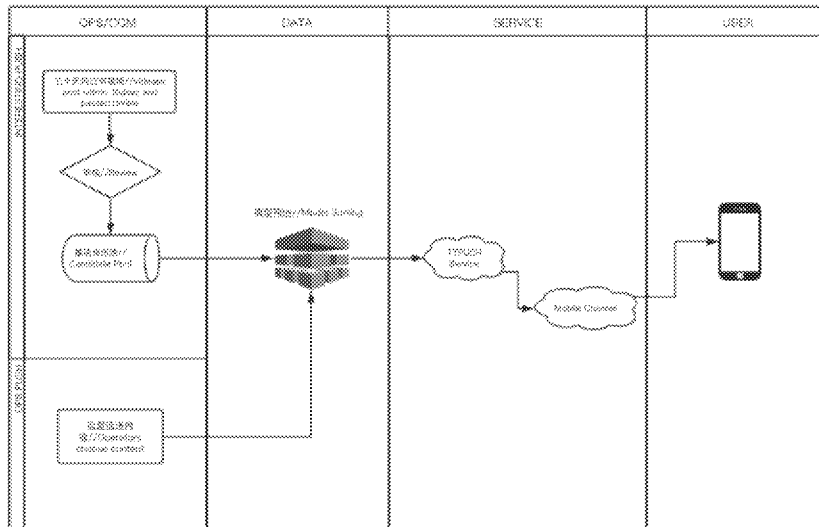


4. How to produce a push?

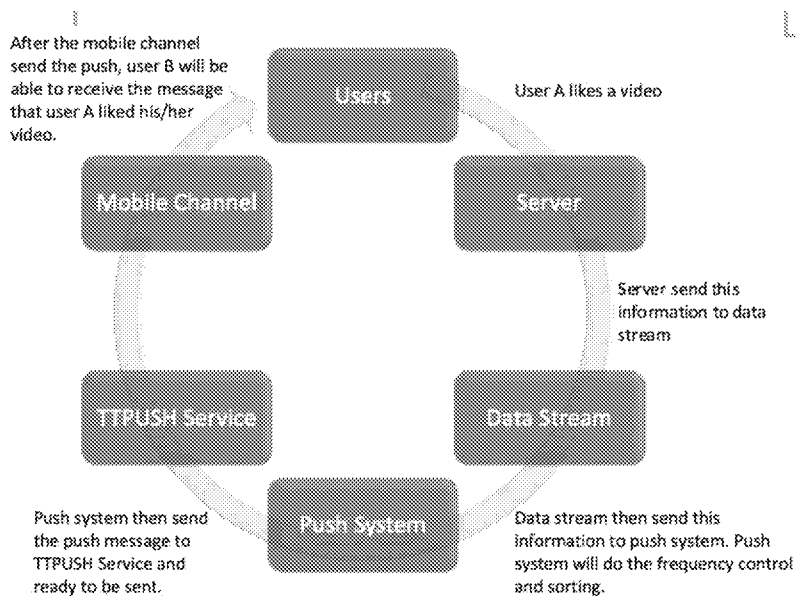
- Intro to push system(Chinese Version):[[HYPERLINK](https://bytedance.feishu.cn/docs/doccngU62dokzhTML6Sfue1ZQFb) "https://bytedance.feishu.cn/docs/doccngU62dokzhTML6Sfue1ZQFb" \h]

How to produce interest/ops push?

- TTPUSH Service: The Push service that ByteDance uses
- Mobile Channel: The channels from which mobile device users receive push



How to produce an interactive push?



5. How to send push? (Push Strategy)

Our strategy is mainly for TT-M, and things might be different for TT-T.

Strategy mainly include 4 aspects: **a. Frequency control ; b. Sorting; c. Push Strategy; d.Filter**

Latest push strategy difference in MT [[HYPERLINK](#)

"https://bytedance.feishu.cn/docs/doccn1FNUy1zBOxTobSQpKo2fd" \h]

6. How to evaluate push?

Focusing on 4 main metrics

1. Impact on **effective dau/retention** in the app

- Push contribution to key metrics can be seen through comparing with reversal experiments of not sending push for a long time

- [[HYPERLINK](#)

"https://data.bytedance.net/libra/flight/329927/report/main?dims=3999_0&display_type=multi_dim&group_id=25005" \h]: **Regional push, interest push reversal experiment**

实验分组	Base User	次日留存	2日留存	3日留存	4日留存	5日留存
v1 对照	79,672,087	0.797165	0.787323	0.749894	0.739244	0.731399
v2 运营Push	+0.285% 79,287,733	-0.0743% 0.796573	-0.111% 0.786489	-0.173% 0.748588	-0.179% 0.73792	-0.238% 0.729559
v3 兴趣	+1.64% 77,777,833	-0.473% 0.795392	-0.506% 0.76344	-0.554% 0.745741	-0.559% 0.734819	-0.645% 0.726583

- * [[HYPERLINK](#)

"https://data.bytedance.net/libra/flight/372290/report/main?dims=2018_0&display_type=multi_dim&group_id=1064" \h]: **Regional push reversal experiment**

实验分组	Base User	次日留存	2日留存	3日留存	4日留存	5日留存	6日留存	7日留存
v1 对照	8,184,579,287	0.861653	0.83164	0.794813	0.785874	0.788738	0.777281	0.772913
v2	+0.0227% 8,184,130,487	+0.0202% 0.861854	+0.04524% 0.831715	+0.01109% 0.79494	+0.01700% 0.78608	+0.00397% 0.788768	+0.00470% 0.77731	+0.00337% 0.772964

- * [[HYPERLINK](#)

"https://data.bytedance.net/libra/flight/315715/report/main?dims=3998_0&display_type=multi_dim&group_id=25004" \h]: **Interest push reversal experiment**

策略名称	策略ID	Base User	次日留存	2日留存	3日留存	4日留存	5日留存	6日留存	7日留存
v1 直播	不推	2,038,820.818	0.820577	0.782873	0.779847	0.77288	0.76811	0.760228	0.754743
v2 直播	不推	2,037,815.882	0.820774	0.793073	0.779713	0.773033	0.768258	0.763407	0.754942
v3 直播	不推	2,015,058.538	0.817227	0.785413	0.776852	0.769644	0.762555	0.757385	0.752188
v4 直播	不推								
v5 直播	不推								
v6 直播	不推	2,018,001.923	0.825167	0.78323	0.780234	0.774028	0.768418	0.764029	0.758645

2. Impact on the **effective penetration/retention** of push-supported features

- **Live room** effective penetration/retention
- **Follow page** effective penetration/retention

3. Impact on the value increase for author being recommended by push

- New follower increase/VV/Interact index

4. Push can be **disturbing to users**

- Percentage of invalid **clicks**
 - Meaning "user clicked the push and left, e.g. stay duration <1s"
 - This metrics is under debugging
- [[- The previous "no/less push to users" a/b testing found that dau & retention fluctuated, and close rate & uninstall decreased.](https://data.bytedance.net/aeolus/)

?Let's elaborate on this with 2 a/b tests

[

- Context: Reduce interruptions to active users in order to improve retention
- Effects: Dau +0.14%; Retention: +0.05%; 10th day Retention: +0.1%; L34 dau +0.2%; Device_send -40%, User_send -54%

[[HYPERLINK "https://data.bytedance.net/libra/flight/240528/report/main"](https://data.bytedance.net/libra/flight/240528/report/main) \h] // Post & live push by ctr prediction model

- Context: reduce interruption and invalid push
- Changes: sending the top 1 push after sorted by ctr >>> sending the push that have the highest **predicted** ctr after sorting
- Effect: mix (post&live) sending-30%, sending ave.device -23.78%, device click -0.2%; 2nd day retention +0.04%, 7-day retention+0.1%; StayDuration: fluctuated

Commented [1]: Does the app capture if the user has opted for notifications has been turned off?

7. How to improve push?

Option 1: Sending Time Optimization;

- * Goal: Find the best push time and the best push count for every user to maximize dau and retention
- * Solution: Build a model based on sending time
 - [[HYPERLINK "https://data.bytedance.net/libra/flight/385005/report/main?end_date=2020-05-11&merge_type=avg&start_date=2020-04-13"](https://data.bytedance.net/libra/flight/385005/report/main?end_date=2020-05-11&merge_type=avg&start_date=2020-04-13) \h]
 - [[HYPERLINK "https://data.bytedance.net/libra/flight/396282/report/main?end_date=2020-05-08&merge_type=avg&start_date=2020-04-29"](https://data.bytedance.net/libra/flight/396282/report/main?end_date=2020-05-08&merge_type=avg&start_date=2020-04-29) \h] launch on 5/14

Option 2: Sending individual push instead of area push via TEA

- * Goal: push the content that the users may be interested in
- * Solution: Sending individual push via TEA: for example "sending comedy challenges to users that have searched for comedy-related words in app; and "sending a music details page to users who have liked more than 3 videos using the same track as a "sound"
 - [[HYPERLINK "https://bytedance.feishu.cn/space/doc/doccn8JqkDkdtBgBzpT2a51stQh"](https://bytedance.feishu.cn/space/doc/doccn8JqkDkdtBgBzpT2a51stQh) \h]// [[HYPERLINK "https://bytedance.feishu.cn/space/doc/doccn3rdbILziStSUcNC9OKXisd"](https://bytedance.feishu.cn/space/doc/doccn3rdbILziStSUcNC9OKXisd) \ | "dXOycH" \h]

Option 3: Expand the candidate pool of interest push

- * Goal: Expand the candidate pool of interest push to support model training

- * Solution: Add more diverse contents into the candidate pool
 - a. Has added resources from Speed up queue, Celebrity, Creator, Hot, [[HYPERLINK "https://bytedance.feishu.cn/docs/doccn4uAMsJA9dihicyUjWTH5Uc" \h](https://bytedance.feishu.cn/docs/doccn4uAMsJA9dihicyUjWTH5Uc)]
 - b. Intend to filter contents with low pass-rate, like content with Non-diversity label/Copyright issues.
 - c. Explore the exchange strategy of high-quality content in different regions

Option 4: Explore for Interest Push caption/text optimization

- * Goal: Send more high-quality captions into the candidate pool, to reduce cannot_push cases due to tolow-quality caption, and release the manpower to review and modify.
- * Solution:
 - a. Has filtered non-local language to increase income of contents with local language and English
 - b. Plan to access English grammar mistake correction service to improve caption quality and pass rate.
 - c. Plan to recall high CTR captions to train recognition model and improve the quality of captions
 - d. Plan to share high-quality caption cases to help moderators understand content.

Option 5: Explore for Interest Push thumbnail optimization

- * Goal: Optimize thumbnail display to improve quality and promote user clicks
- * Solution:
 - a. Filter low-quality (black screen, white screen, blurred picture) thumbnails through the model, and select high-quality frame or user profile picture as a new thumbnail

Q&A : Please write down your questions in the doc below

[[\ "55da0e" \h](https://bytedance.feishu.cn/sheets/shtcnjYWjdtneJzECJpQ1NMNtje?amp=&table=tblEO3Y00X&view=vewnMkB2c6)]

"https://bytedance.feishu.cn/sheets/shtcnjYWjdtneJzECJpQ1NMNtje?amp=&table=tblEO3Y00X&view=vewnMkB2c6" \ "55da0e" \h]

Part of Q&A in [HYPERLINK "https://bytedance.feishu.cn/docs/doccnYzeYmK00KlFQHxAXnC1p4c"
\h]

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