

AMENDED Exhibit 416

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

[P&C] TT-m User Age Model Launch Announcement

Context

In order to improve user experience, TikTok-Data team and TikTok-Product team trained and iterated the user age model in June 2021. Based on the improvement of model performance, we conducted AB tests and explained the changes of all the core metrics. Currently we have already launched the new version of User Age Model in TT-m regions (va & sg-m) on Oct 27.

Following are TikTok age models progress and POCs:

	A	B	C	D	E	F	G	H
1	Age Mod Region		Project Stages					Project Poc
2		TT-m	Problem Defining & Analysis	Model Training	AB Test	Validation and Launch	Monitoring and Iteration	
3	User	TT-t	Problem Defining & Analysis	Model Training	AB Test	Validation and Launch	Monitoring and Iteration	
4		JP&KR	Problem Defining & Analysis	Model Training	AB Test	Validation and Launch	Monitoring and Iteration	
5	Video	global	Problem Defining & Analysis	Model Training	AB Test	Validation and Launch	Monitoring and Iteration	

User Age Model Performance

• Precision & Recall on DAU testset (TT-m only)

- For details: [\[P&C\] TikTok用户年龄模型迭代分享](#) [TikTok User Age Model Updates](#)

	A	B	C	D	E	F
1	Online Model		New Model			
2	All the users	Precision	Recall	All the users	Precision	Recall
3	1	27.24%	61.69%	1	65.92%	78.11%
4	2	18.37%	22.50%	2	46.09%	49.17%
5	3	41.01%	49.65%	3	61.91%	43.97%
6	4	26.16%	61.10%	4	54.30%	61.63%
7	5	20.09%	77.01%	5	57.35%	22.41%
8	Unsure/-1	78.06%	6.32%	Unsure/-1	75.74%	82.93%
9	1+2	33.91%	65.97%	1+2	64.48%	74.03%
10	3+4+5	43.43%	85.05%	3+4+5	77.19%	64.54%

• Proportion Changes

- Global Proportion

	A	B	C	D	E	F
1	Old Model		New Model		Human Label (Ground Truth)	
2	Level	Proportion	Level	Proportion	Level	Proportion
3	1	19.82%	1	9.09%	1	8.37%
4	2	7.00%	2	6.71%	2	5.48%
5	3	21.64%	3	17.05%	3	20.28%
6	4	33.41%	4	16.44%	4	15.48%
7	5	10.11%	5	1.66%	5	3.91%
8	Unsure/-1	8.02%	Unsure/-1	49.05%	Unsure/-1	46.48%

○ By Countries

	A	B	C	D	E	F
1	country_co	dau_1010	login%	online%	new%	diff绝对值
2	US	74,929,044	98%	92%	50%	-41%
3	CA	6,437,643	89%	86%	44%	-42%
4	AU	4,467,440	88%	85%	40%	-45%
5	JP	10,688,674	81%	57%	10%	-47%
6	KR	3,035,503	79%	51%	15%	-37%
7	GB	12,844,207	97%	94%	47%	-45%
8	DE	10,291,620	97%	92%	34%	-58%
9	FR	10,316,652	97%	93%	41%	-52%
10	IT	8,387,357	99%	95%	46%	-49%
11	ES	7,921,143	97%	93%	45%	-45%
12	NL	2,799,465	97%	93%	43%	-50%
13	PL	4,544,891	95%	91%	32%	-59%
14	RU	31,740,430	76%	73%	27%	-47%
15	BR	34,628,401	84%	81%	45%	-35%
16	MX	24,847,634	87%	83%	41%	-42%
17	AR	6,597,239	88%	85%	44%	-40%
18	ID	49,466,434	85%	55%	50%	-5%
19	VN	27,228,476	83%	55%	52%	-3%
20	TH	22,832,141	86%	61%	59%	-1%
21	PH	21,065,921	90%	63%	62%	-1%
22	TR	15,449,195	79%	76%	33%	-43%
23	SA	12,197,424	79%	76%	23%	-53%
24	EG	9,612,672	76%	71%	28%	-43%
25	AE	3,443,930	83%	81%	43%	-37%
26	ZA	2,877,235	75%	71%	31%	-40%

AB Test

- Experiment link (15% traffic) : Libra Link
- Launch Review Link: [TT-M] User Level Model Upgrade
- Summary: Replace users' age using predictions of the new user level model. Both the candidate pool and online strategies in sort and predict are impacted, except **live-related strategies** (The live_head video retriever, viking_finish_live, is affected because it succeed the main video candidate pool). The stay-alpha is increased to balance the tradeoff between publish and staytime.
- Key changes:
 - * Staytime +0.0646%, confidence interval [0.02%, 0.11%]
 - * Publish/U stays +1.148%, confidence interval [1.021%, 1.46%]
 - * PubUser/User +1.003%, confidence interval [0.666%, 0.822%]

How to get data of the new model?

From **Hive table** level, we will offer full access to the new model results to data related colleagues.

For most users who usually access the data from Aeolus dashboards, we will align the model change with all dashboard owners by the end of this week.(Oct 29th) We plan to adjust most of the dashboards starting next bi-month(Nov-Dec) and fully align

with how the model result is used online.

More Details: 回新level模型数仓改造方案 回TikTok 用户预测年龄区间标识 数仓字段调整说明

Hive Details:

- * musically.mds_dim_user
 - o Added the merged field//新增融合字段: predicted_age_group_classifier_global_report
 - * M region new model, T region & South Asian old model
 - * 30 days fixed label
 - o Effective partition//预计生效分区: **October 27th**
- * musically.tdi_user_predicted_info_merge
 - o Added new model field v1//新增新模型字段predicted_age_group_classifier_global_v1
 - o Added the merged field//新增融合字段: predicted_age_group_classifier_global_report
 - * M region new model, T region & South Asian old model
 - * 30 days fixed label
 - o Effective partition//预计生效分区: **September 3rd**

From **Server** perspective, request for tiktok.user.feature_tag rpc

- * psm: tiktok.user.feature_tag
- * Field: UserFeature.PredictedAgeGroup.ClassifierGlobalV1 (request FeatureTagEnumList = [14])

Long-term Plan

Data monitoring [WIP]

1. Model Performance Monitoring: TT-t, TT-m overall monitoring for precision, recall, proportion (all users & 10k fans users)
2. Recommendation Strategies Monitoring:
 - * Safety: L1 leakage vv percentage / Minor leakage vv percentage
 - * Creator Experience:
 - o False Positive L1 video percentage
 - o False Positive L1 creator percentage
3. Labeling Monitoring: Productivity & Accuracy
4. Reverse Experiment Monitoring (consumption & publish)
 - * [REDACTED]
 - * [REDACTED]

Model Improvement

1. Keep optimizing based on the confusion matrix. Optimize Video/Profile picture model for L1-5.
2. Exploration of model features in markets with lower publish or p&r rate.

Timeline

- ☐ TT-t User Age Model (non JP & KR regions) conduct AB test [REDACTED] Oct 29
- ☐ Explore JP & KR User Age Model Redesign features & guidelines [REDACTED]
- ☐ Global Video Age Model Training [REDACTED]

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