Analysis of Churn Rates for the Media Product

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Supporting Model Analysis

Full Logistic Regression Model vs Lasso

	full logistic regression	lasso
t	V	V
trial	V	V
nextpreice	V	V
sports1		V
news1		V
crime1		
life1		
boits1		
business1		
opinion1		
mobile		
tablet		V
desktop	V	V

Why we chose Lasso?

- Simplifying the model & highlighting the most predictive features (feature selection)
- Prevention of Overfitting
- Mitigating Multicollinearity
- Involving CV to choose the penalty term
- Better with Large Datasets

Key Differences with fitting Lasso Regression:

Excluded content variables: crime1, life1, obits1, business1, opinion1

Excluded device: Mobile
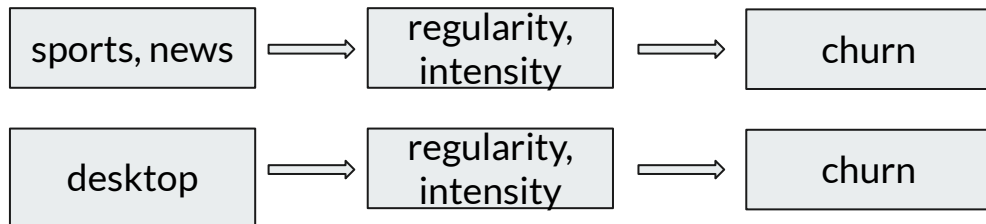
Relevant Predictors: Sports1, news1, and tablet

Drop: Regularity

# Regularity vs. Intensity

Model <chr>	regularity <dbl>	intensity <dbl>
Model 1	−0.02650976	−0.007710695
Model 2	−0.03194412	*NA*
Model 3	*NA*	−0.018856812

3 rows

Multicollinearity ATTENTION
PIPE effect

sports, news → regularity, intensity → churn

desktop → regularity, intensity → churn

Recommendations through two aspects:
- Content: Provide targeted and personalized content
- Device: Improve user interface experience

Content

Coefficient of Content Categories
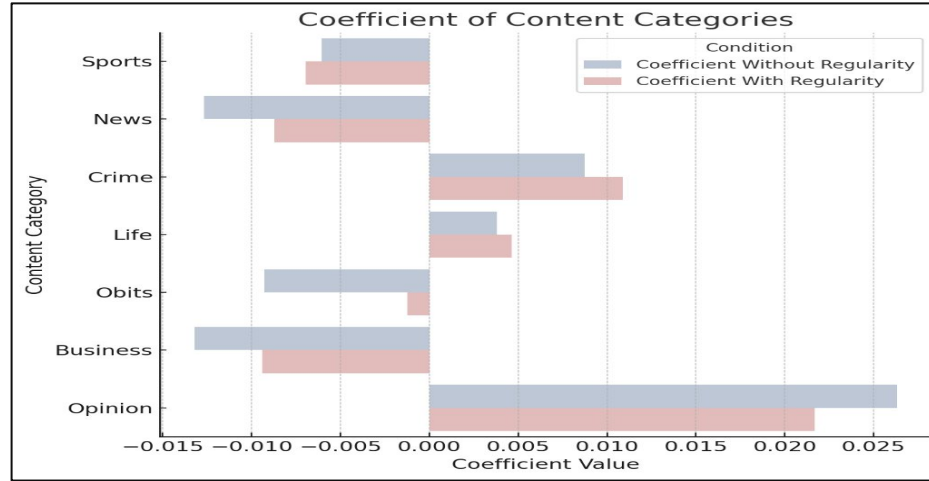
Recommendations:

- Send out weekly newsletter (summary) of news and sports updates based on user preference (NFL, MLB, NBA, NHL, etc.)

- Create a community forum about sports and news where allows the users to share opinions and interact with each other, fostering a sense of community engagement

- Optimize the User Interface (UI) by implementing features like the personalized homepages of chosen topics, trending sections, and quick access to live events
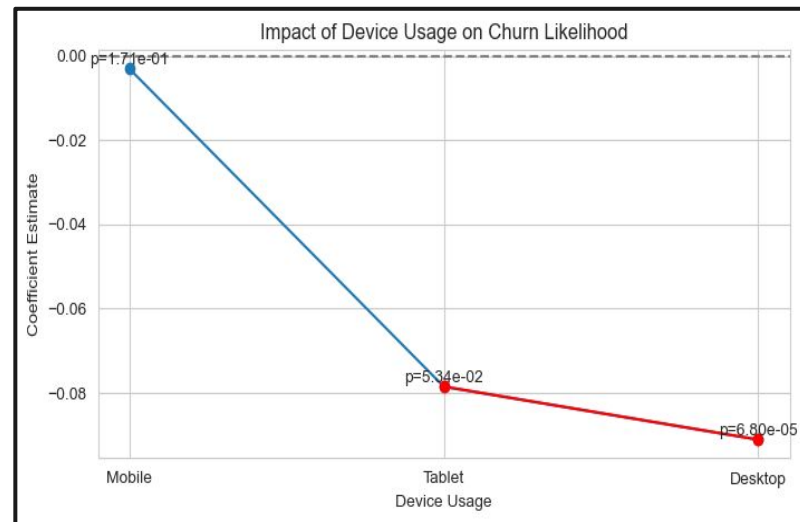
Device

Recommendations:

- Focus improvement on Desktop app -> more cost effective
  - Monitor tablet usage due to potential trends
- Enhancing the desktop app with unique features
- Improve user experience on Desktop especially for viewing sports and news content.
  - High correlation between 'Desktop' and 'Sports' and 'Desktop' and 'News.'

Red section indicates a statistically significant relationship between desktop usage and churn

```
> cor(np[, c("sports1","news1","crime1","life1","obits1","business1","opinion1","desktop", "tablet", "mobile" )])
           sports1    news1    crime1     life1    obits1 business1  opinion1      desktop      tablet       mobile
sports1   1.00000000 0.4861148 0.3745403 0.4956749 0.08746111 0.3868088 0.2947087  0.5135945555  0.22811074  0.2776963583
news1     0.48611476 1.0000000 0.7968095 0.7324487 0.29673714 0.7417767 0.6443315  0.5904424445  0.22346003  0.3411632440
crime1    0.37454029 0.7968095 1.0000000 0.6319266 0.32786547 0.6639045 0.5188632  0.4679249258  0.26229082  0.3375699726
life1     0.49567490 0.7324487 0.6319266 1.0000000 0.17748451 0.7008035 0.5292420  0.5614829325  0.12145290  0.2279075007
obits1    0.08746111 0.2967371 0.3278655 0.1774845 1.00000000 0.2451812 0.2222497  0.2525486425  0.18202964  0.0588006549
business1 0.38680884 0.7417767 0.6639045 0.7008035 0.24518123 1.0000000 0.5112372  0.5215124571  0.16491642  0.2173430392
opinion1  0.29470874 0.6443315 0.5188632 0.5292420 0.22224972 0.5112372 1.0000000  0.3701101103  0.18617610  0.1637013975
desktop   0.51359456 0.5904424 0.4679249 0.5614829 0.25254864 0.5215125 0.3701101  1.0000000000 -0.06926456  0.0001040844
tablet    0.22811074 0.2234600 0.2622908 0.1214529 0.18202964 0.1649164 0.1861761 -0.0692645553  1.00000000 -0.0229291368
mobile    0.27760636 0.3411632 0.3375700 0.2270075 0.05880065 0.2173430 0.1637014  0.0001040844 -0.02292914  1.0000000000
```

Trial

Statistics:
- From 1348 trial rate offers, 1222 users continued their subscription, resulting in a 90.7% conversion rate
- On average, users who churned had a non-trial subscription duration of 3.04 months
- Potential reasons: trial expiration or customers' trial-signup behavior
- Positive and statistically significant (p = 0.0458), indicating that customers who are on a trial are more likely to churn

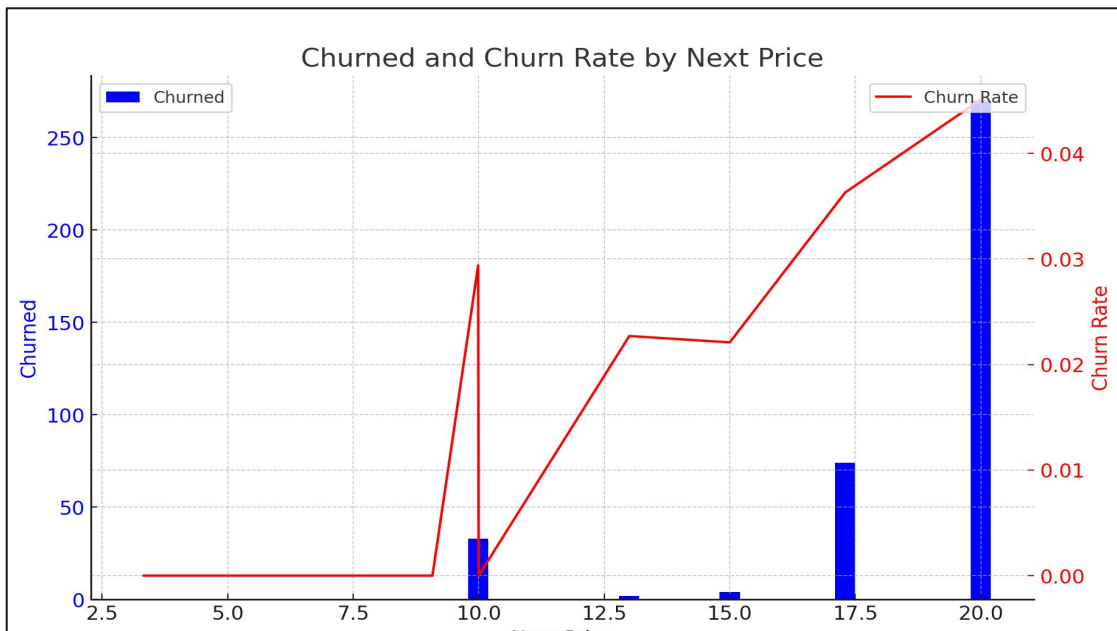**Histogram of Trial Count**

Frequency vs Trial Count

Recommendation:
- **Targeted emails and notifications** during the trial period
- Offer trial money back if customer stays for a year (but only if trial price is substantial)
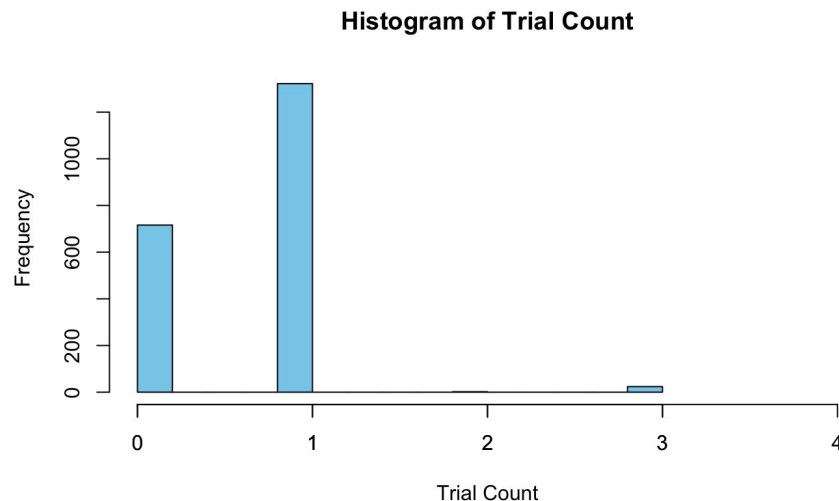
NextPrice

Churn rates for different Subscription Prices

Statistics:

- Churn Spike Just Below 10 dollars indicating high sensitivity

- Gradual Increase between $10-$20 -> Conduct thorough price sensitivity analysis
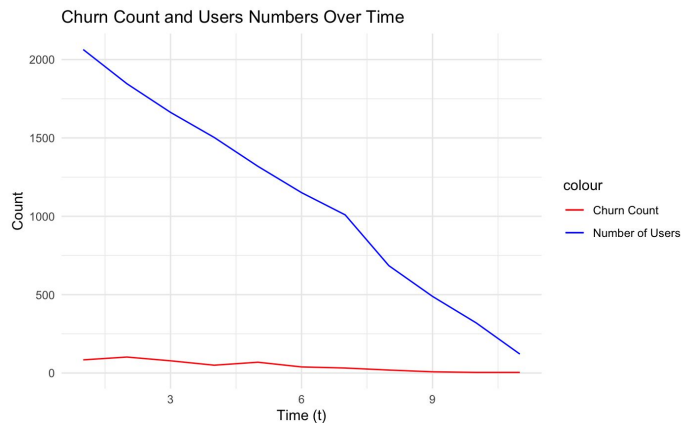
Recommendations:

- Offering loyalty discounts or rewards to long-term subscribers

- Introduce price differentiation to attract a wider customer base, particularly those who are price-sensitive.

Time t

- Time(t): Variable t representing time was significant and negative in the lasso model, implying that as time goes on, the likelihood of churn decreases.
- This can be interpreted as customers who remain with the service over time are less likely to churn, highlighting the importance of customer lifecycle.

Recommendation:

Introduce discounted rates or additional benefits for customers who subscribe to long-term plans (e.g., annual subscriptions)

Churn Rate Over Time

Churn Count and Users Numbers Over Time
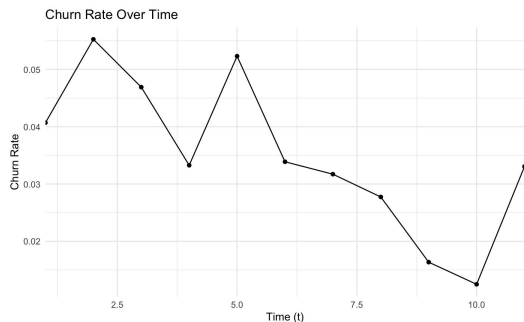
Final Recommendations

- **T:** Focus on retaining the customer for a longer period through loyalty programs and promotions

- **Trial:** Trial customers have higher likelihood to churn so focusing on retention strategies by improving user onboarding to provide a smooth, intuitive, and effectively communicative process

- **Content:** Target on promoting sports and news content

- **Device:** Improve user experience on desktop apps

- **Regularity:** Improve based on content and device

THANK YOU FOR YOUR LISTENING

Appendix A

	nextchurn	t	trial	nextprice	regularity	intensity	sports1	news1	crime1	life1
nextchurn	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
t	NA	1.00000000	-0.44249212	NA	-0.2338832	-0.1834243	-0.10927286	-0.13358533	-0.09965130	-0.02855867
trial	NA	-0.44249212	1.00000000	NA	0.1838662	0.1494231	0.10457443	0.09001513	0.08089107	0.02341488
nextprice	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
regularity	NA	-0.23388320	0.18386622	NA	1.0000000	0.4902455	0.55671409	0.55160160	0.51258070	0.38195478
intensity	NA	-0.18342428	0.14942310	NA	0.4902455	1.0000000	0.59855460	0.71617433	0.60409355	0.62249721
sports1	NA	-0.10927286	0.10457443	NA	0.5567141	0.5985546	1.00000000	0.48611476	0.37454029	0.49567490
news1	NA	-0.13358533	0.09001513	NA	0.5516016	0.7161743	0.48611476	1.00000000	0.79680948	0.73244869
crime1	NA	-0.09965130	0.08089107	NA	0.5125807	0.6040936	0.37454029	0.79680948	1.00000000	0.63192664
life1	NA	-0.02855867	0.02341488	NA	0.3819548	0.6224972	0.49567490	0.73244869	0.63192664	1.00000000
obits1	NA	-0.06413623	0.05124861	NA	0.3183052	0.2469580	0.08746111	0.29673714	0.32786547	0.17748451
business1	NA	-0.04687109	0.02921467	NA	0.4295396	0.5764350	0.38680884	0.74177665	0.66390453	0.70080346
opinion1	NA	-0.08018140	0.05134520	NA	0.3412826	0.4790911	0.29470874	0.64433152	0.51886322	0.52924202
mobile	NA	-0.09962180	0.07504326	NA	0.4108651	0.2716088	0.27769636	0.34116324	0.33756997	0.22790750
tablet	NA	-0.07185005	0.06585170	NA	0.3054455	0.1925668	0.22811074	0.22346003	0.26229082	0.12145290
desktop	NA	-0.09534683	0.07063081	NA	0.5977743	0.5354464	0.51359456	0.59044244	0.46792493	0.56148293

	obits1	business1	opinion1	mobile	tablet	desktop
nextchurn	NA	NA	NA	NA	NA	NA
t	-0.06413623	-0.04687109	-0.0801814	-0.0996217976	-0.07185005	-0.0953468329
trial	0.05124861	0.02921467	0.0513452	0.0750432552	0.06585170	0.0706308122
nextprice	NA	NA	NA	NA	NA	NA
regularity	0.31830520	0.42953964	0.3412826	0.4108651268	0.30544553	0.5977742957
intensity	0.24695796	0.57643504	0.4790911	0.2716088070	0.19256683	0.5354464371
sports1	0.08746111	0.38680884	0.2947087	0.2776963583	0.22811074	0.5135945555
news1	0.29673714	0.74177665	0.6443315	0.3411632440	0.22346003	0.5904424445
crime1	0.32786547	0.66390453	0.5188632	0.3375699726	0.26229082	0.4679249258
life1	0.17748451	0.70080346	0.5292420	0.2279075007	0.12145290	0.5614829325
obits1	1.00000000	0.24518123	0.2222497	0.0588006549	0.18202964	0.2525486425
business1	0.24518123	1.00000000	0.5112372	0.2173430392	0.16491642	0.5215124571
opinion1	0.22224972	0.51123720	1.0000000	0.1637013975	0.18617610	0.3701101103
mobile	0.05880065	0.21734304	0.1637014	1.0000000000	-0.02292914	0.0001040844
tablet	0.18202964	0.16491642	0.1861761	-0.0229291368	1.00000000	-0.0692645553
desktop	0.25254864	0.52151246	0.3701101	0.0001040844	-0.06926456	1.0000000000

Appendix B

	LASSO full	LASSO (no regularity intensity)	engagement	content	device	engagement + content	full model
t	V	V	V	V	V	V	V
trial	V	V	V	V	V	V	V
nextpriece	V	V	V	V	V	V	V
sports1		V		V			
news1		V		V			
crime1							
life1							
obits1							
business1							
opinion1							
mobile							
desktop	V	V			V	V	
tablet		V			(V)		
regularity	V		V				V
intensity	V						

V: STATISTICALLY SIGNIFICANT
blue shade: feature included in model