

Data, Algorithms and Editors

Liad Agmon, CEO



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About DY

Founded: 2011

Personalization and Engagement Optimization

Publishing customers generate ~5B page-views / month



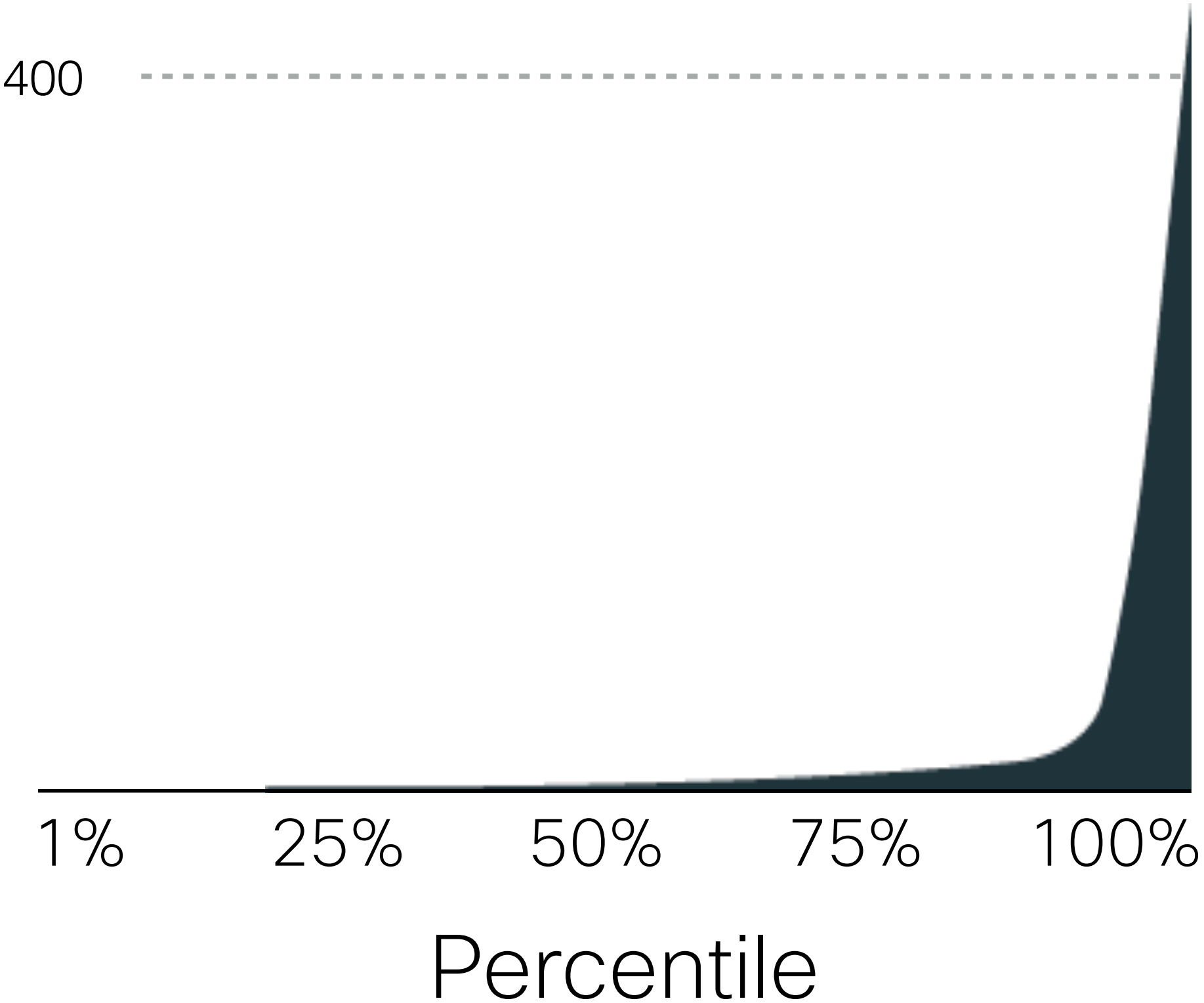
Welcome to
Pareto's World

80/20

Total Page Views

20M+ Uniques, last 30 days

Page-views per user

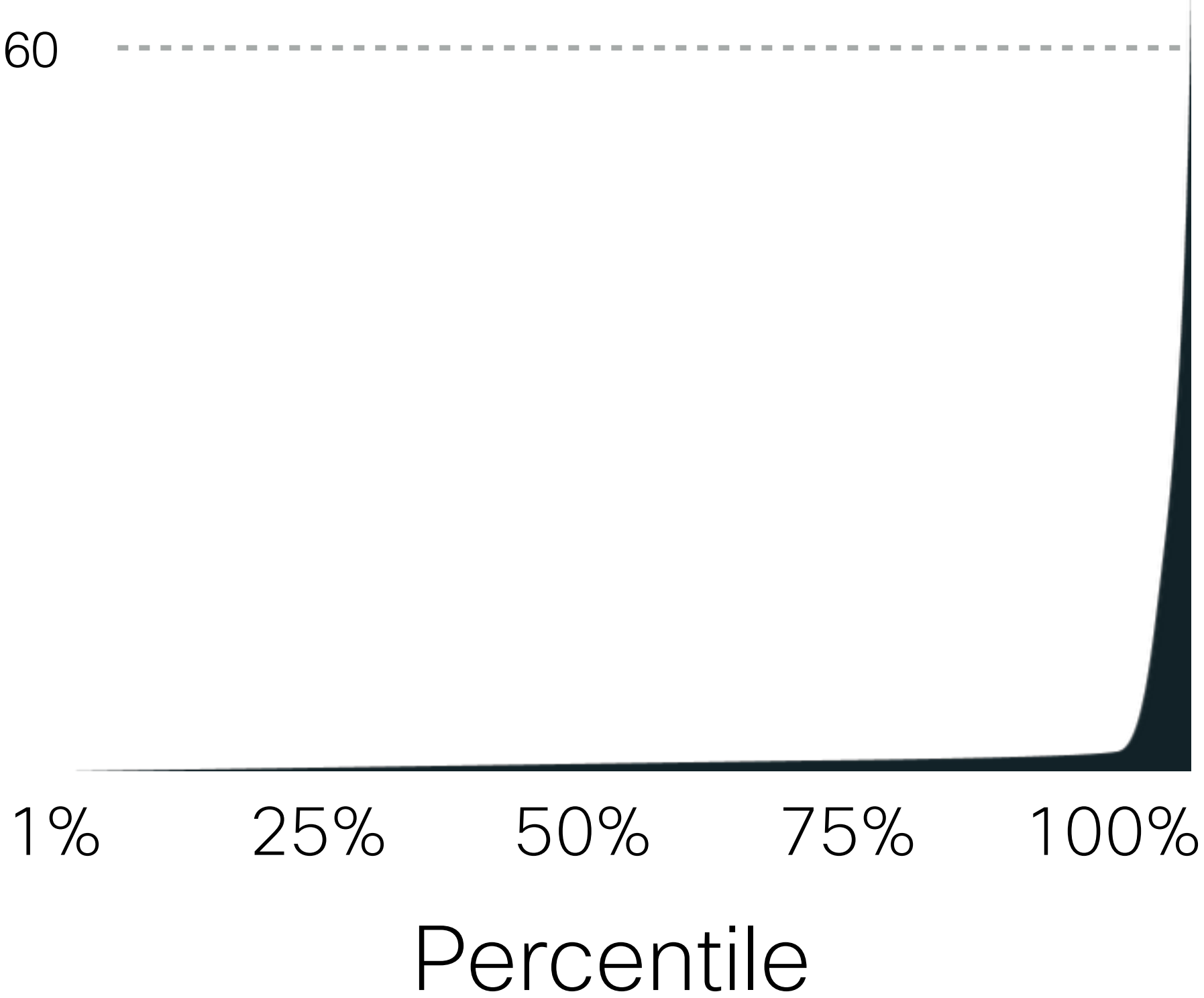


Percentile	% of Total Page-Views		
99-100	69%	133M	Top Users
94-98	12%	23M	Nurture
89-93	4%	7M	Nurture
1-63 (single page-view)	7%	14M	Audience Development

Total Video Views

20M+ Uniques, last 30 days

Video views per user



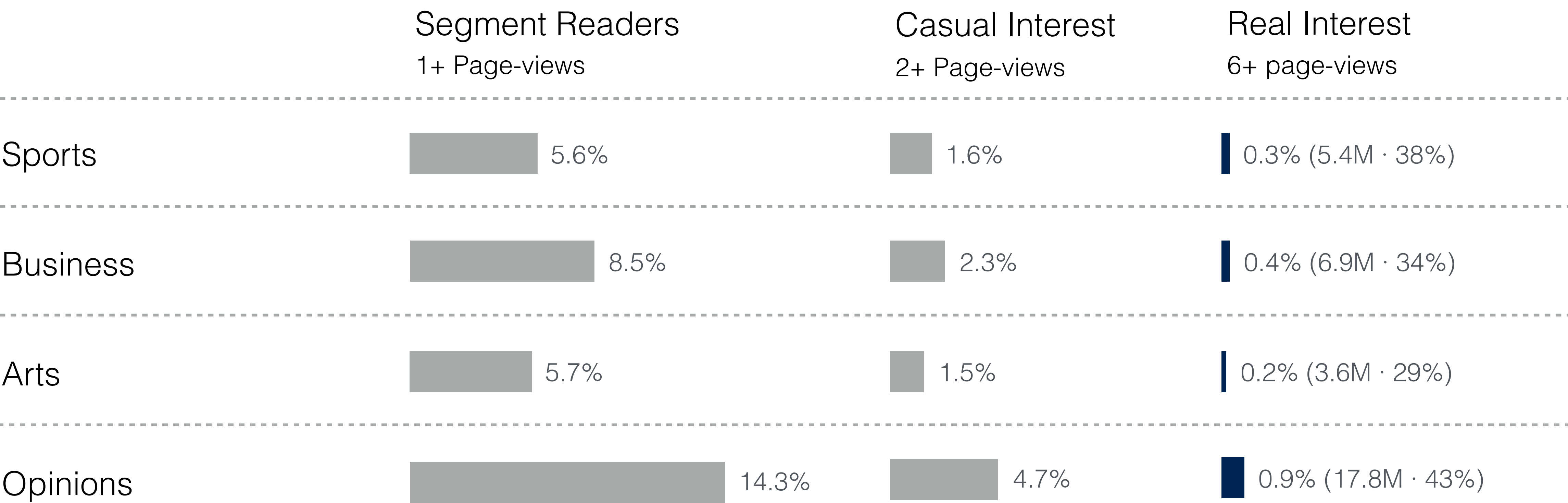
Percentile

% of Total Video Views

0.2%	13%	<div></div> 3.4M	Top Users
2%	34%	<div></div> 8.6M	Nurture
2%	13%	<div></div> 3.2M	Nurture
1-68	0 views		Audience Development

Distribution of User Interests

Data source: premium publisher, 1 month, 100,000,000+ unique visitors





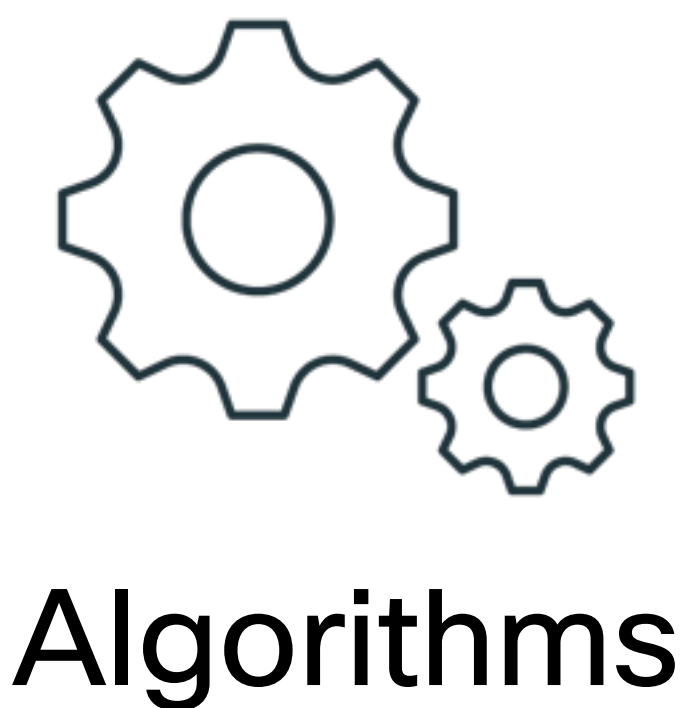
5% of users generate 50% of ad-clicks

75% of users never click on ads

Conflicting Interests

Publisher KPIs

User Engagement
Ad sales and Ad Clicks
Subscriptions
Mobile (apps, native)



User Preferences

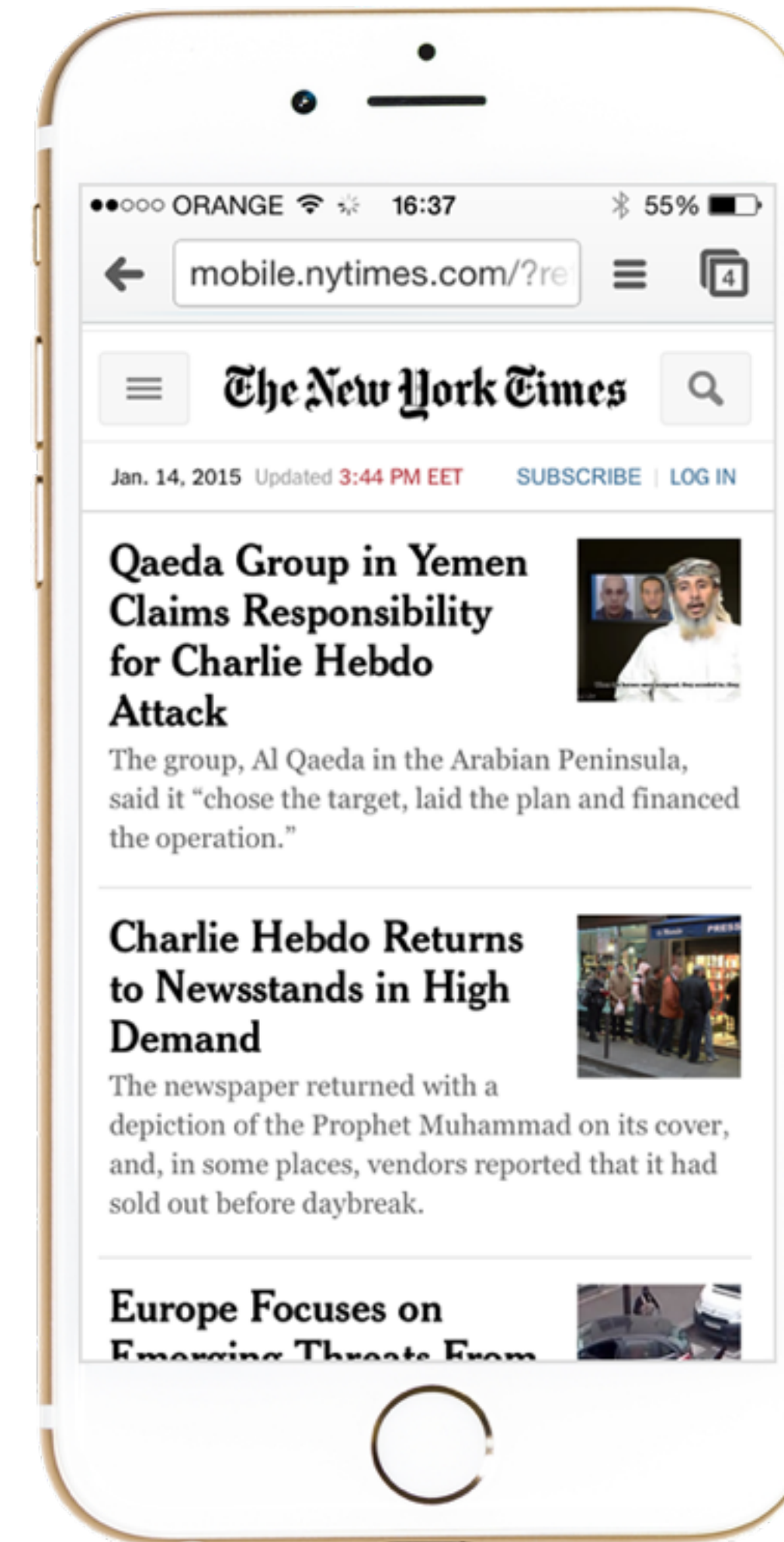
Scan the news
Read 1-2 articles (75% of users)
Pulp content

link-baits

Short Content

While Maintaining long-term brand equity

It's a real-estate
optimization problem





Smart Editors

+

Algorithms

=

**Superior
Experience**

A few examples

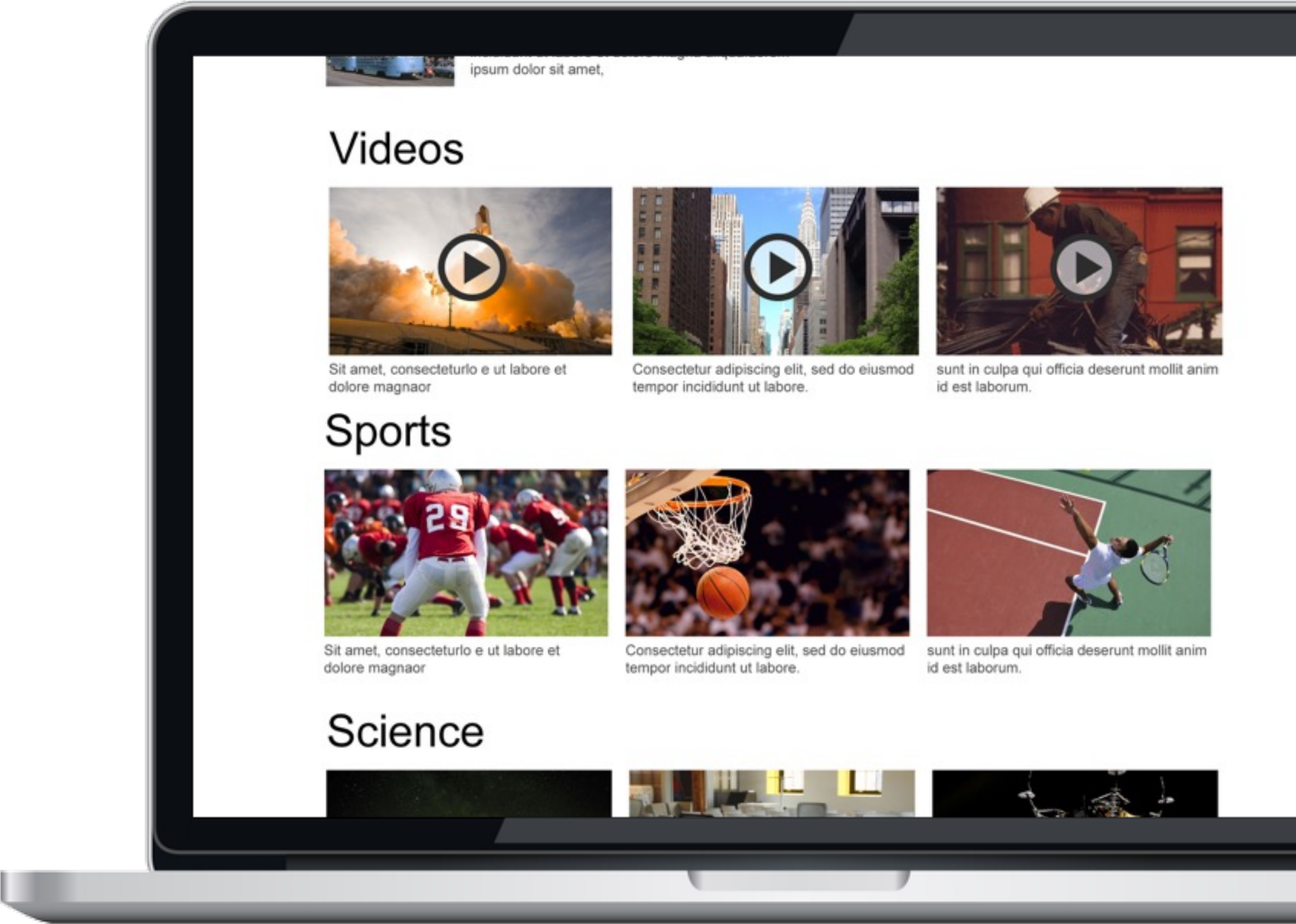
Automated Sections



Automated Sections



Content feed



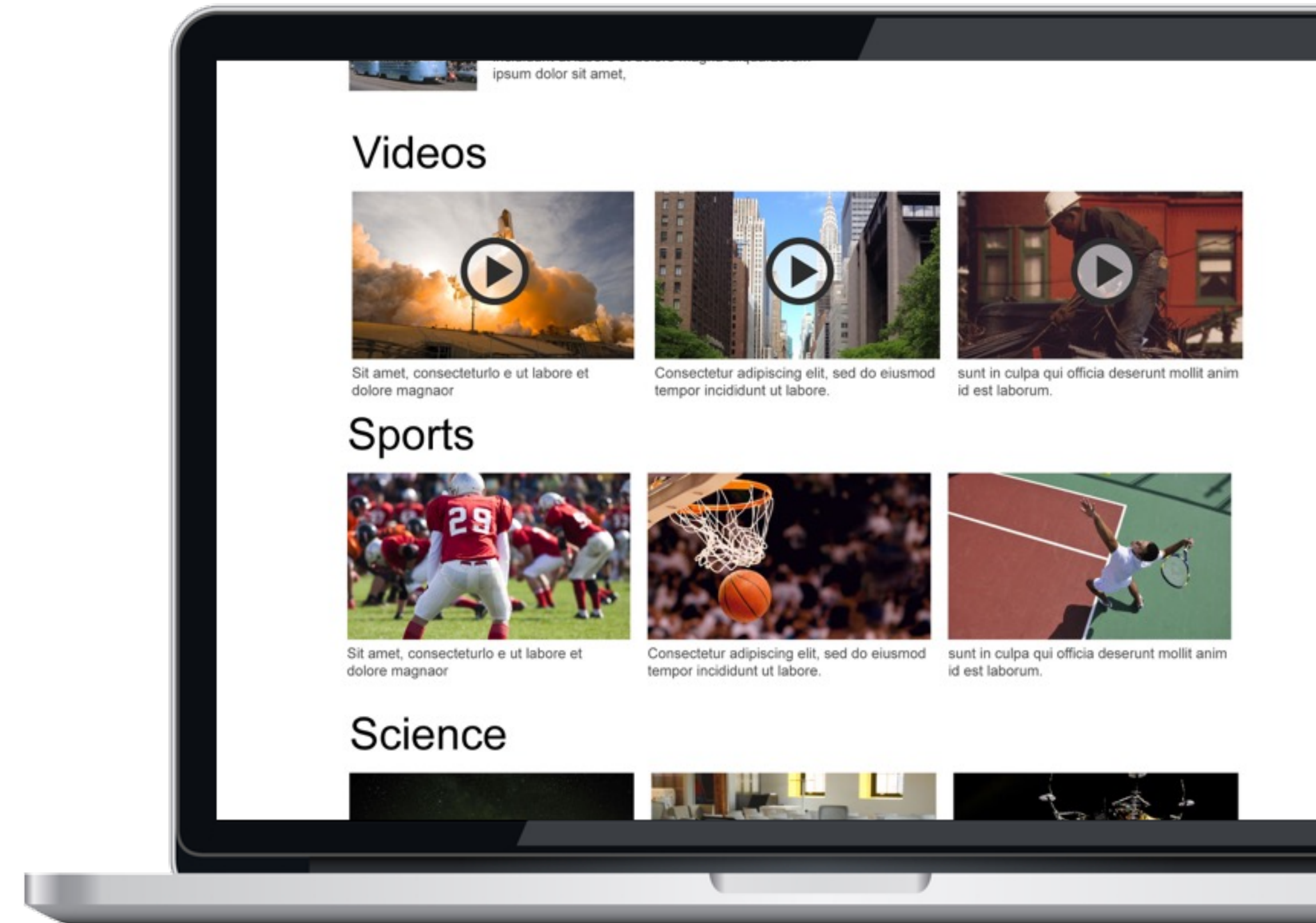
Automated Sections



Content feed



Freshness threshold



Automated Sections



Content feed

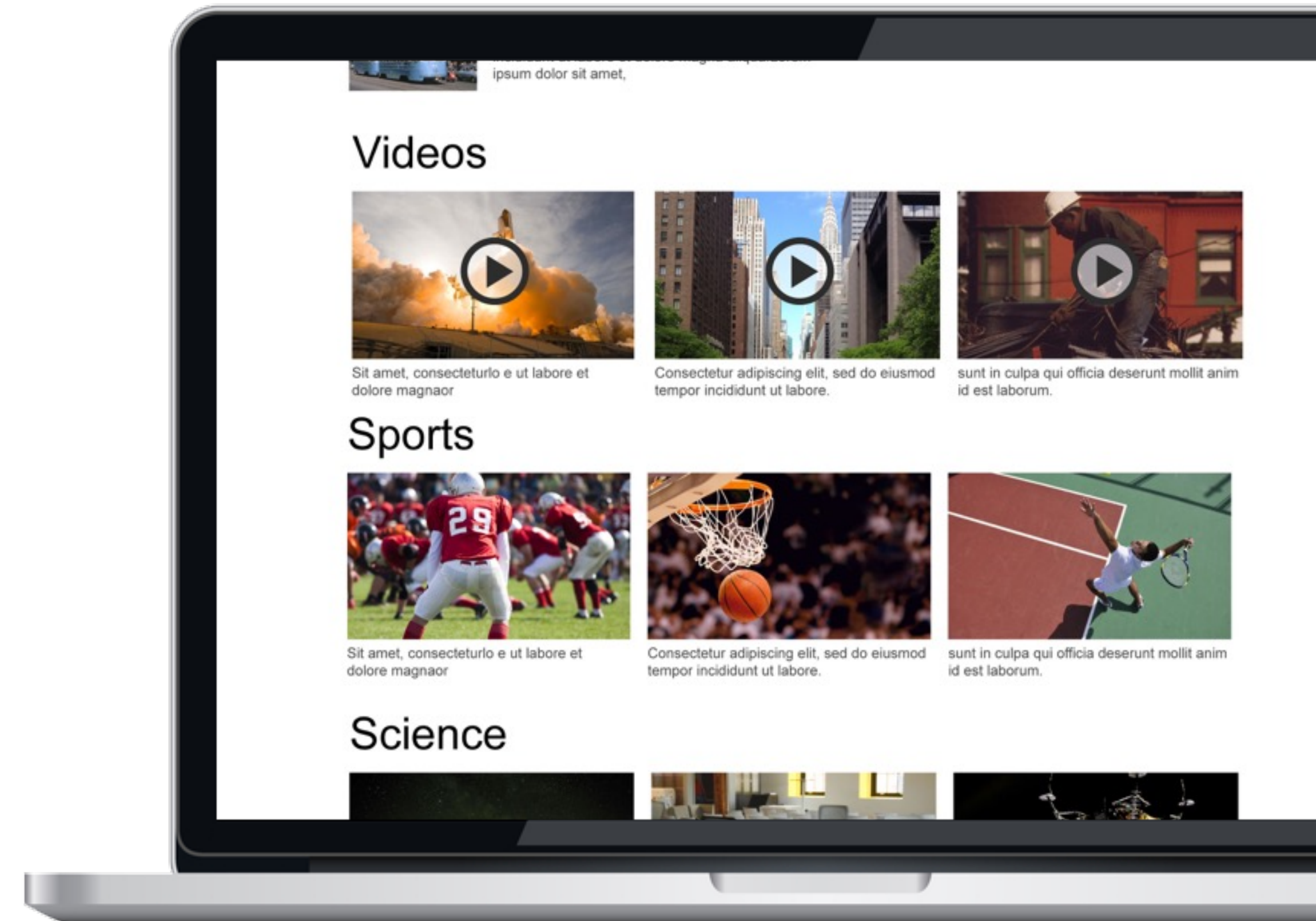


Freshness threshold



Score

$\text{page-views} / (\text{age} \wedge \text{gravity})$



Automated Sections



Content feed



Freshness threshold

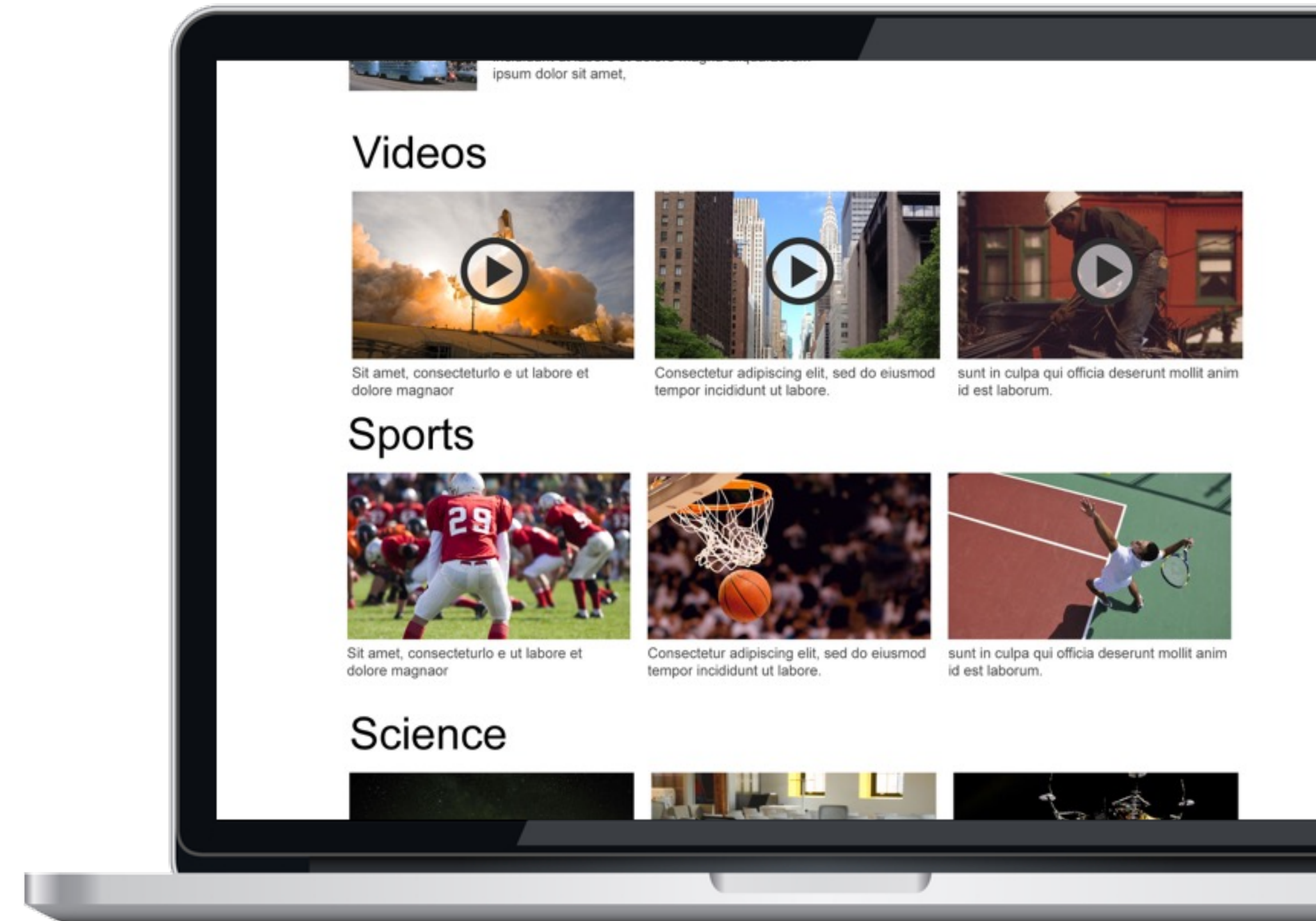


Score

$\text{page-views} / (\text{age} \wedge \text{gravity})$



Contextual Bandit Algorithms



Automated Sections



Content feed



Freshness threshold



Score

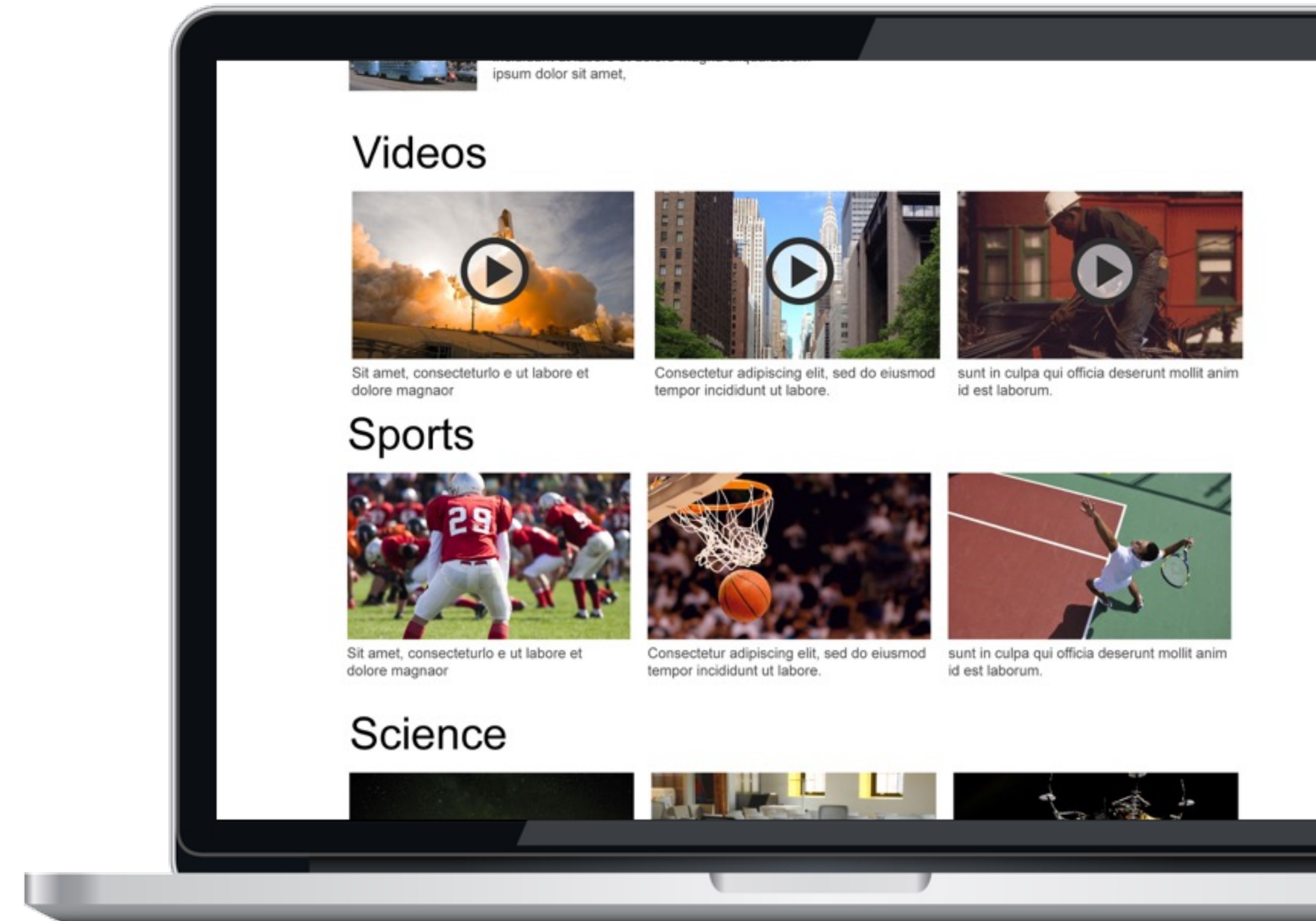
page-views / (age ^ gravity)



Contextual Bandit Algorithms

170% uplift

CTR: 0.34% → 0.923%

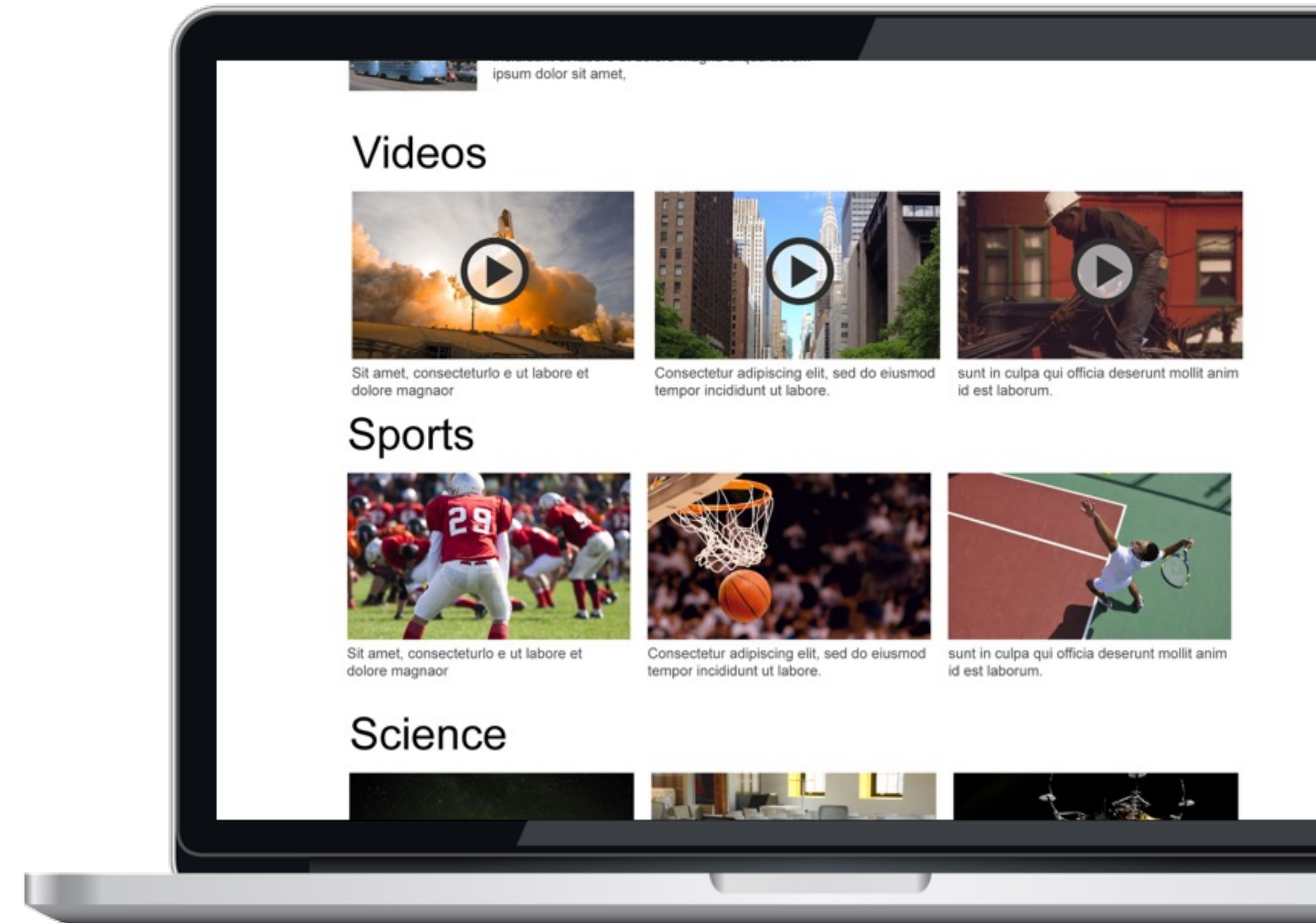


Dynamic Homepage Layout



Choose an audience segment

Example: users who view more than
3 videos / month (16% of total users)



Dynamic Homepage Layout

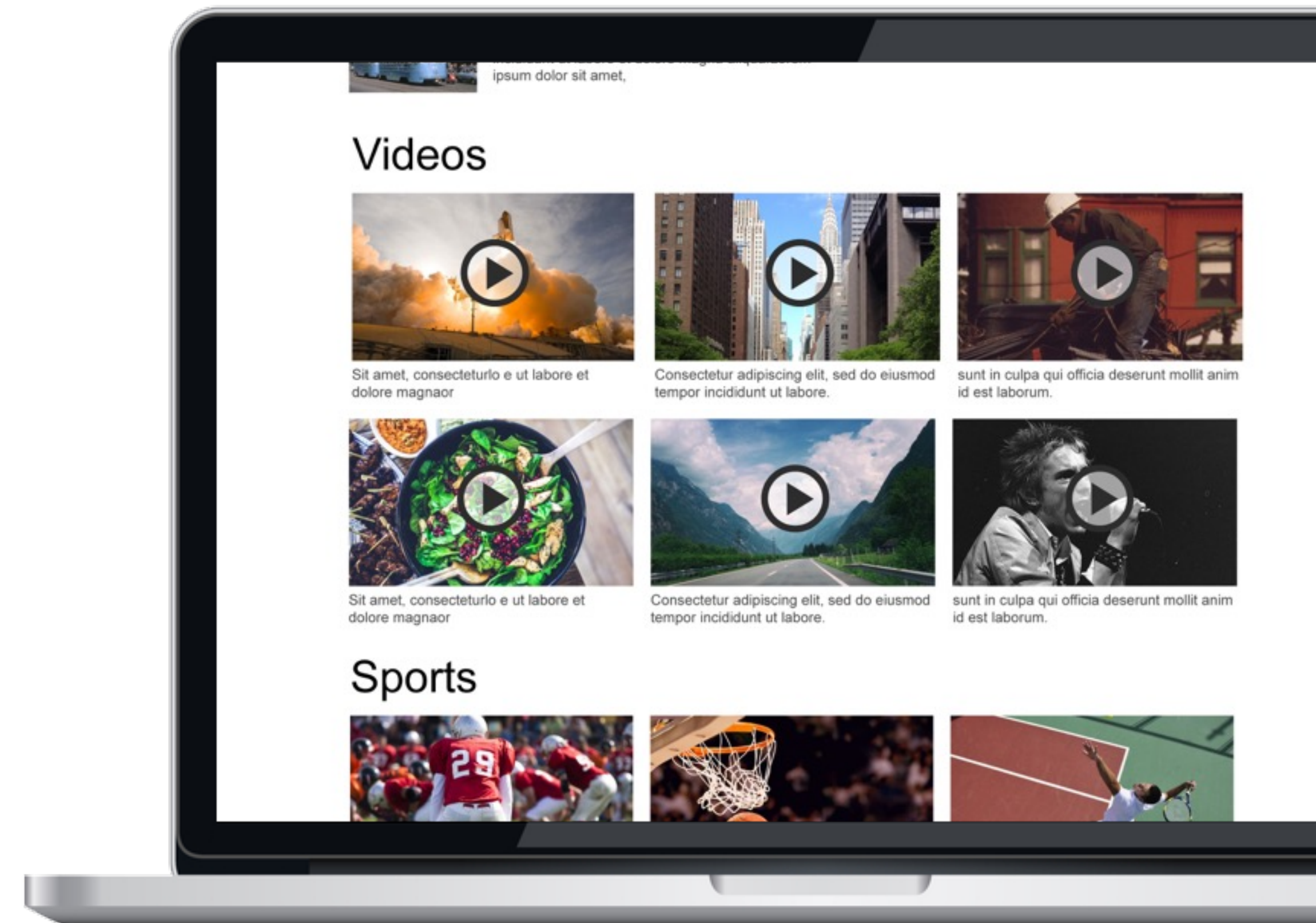


Choose an audience segment

Example: users who view more than
3 videos / month (16% of total users)



Show extended video section



Dynamic Homepage Layout



Choose an audience segment

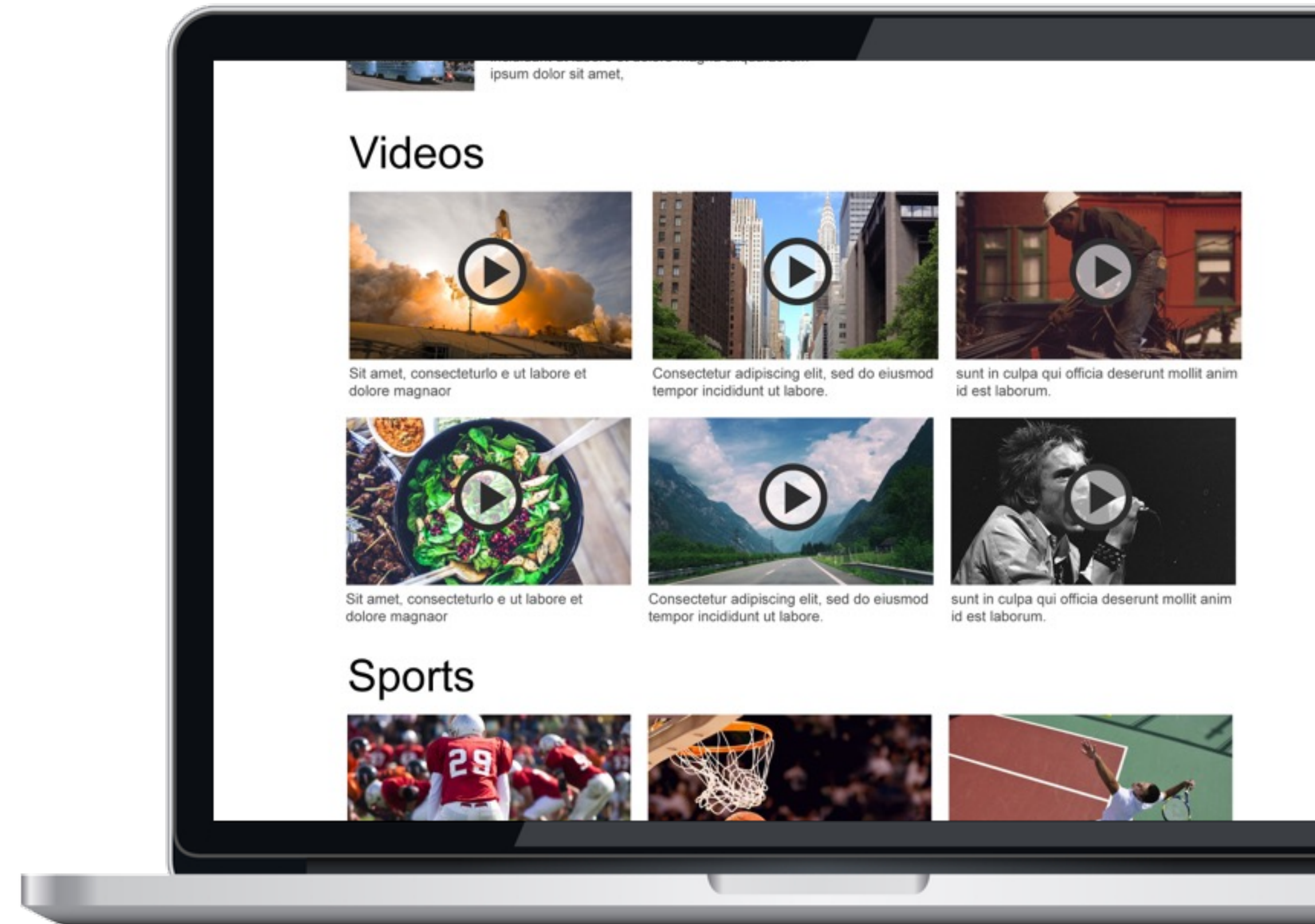
Example: users who view more than
3 videos / month (16% of total users)



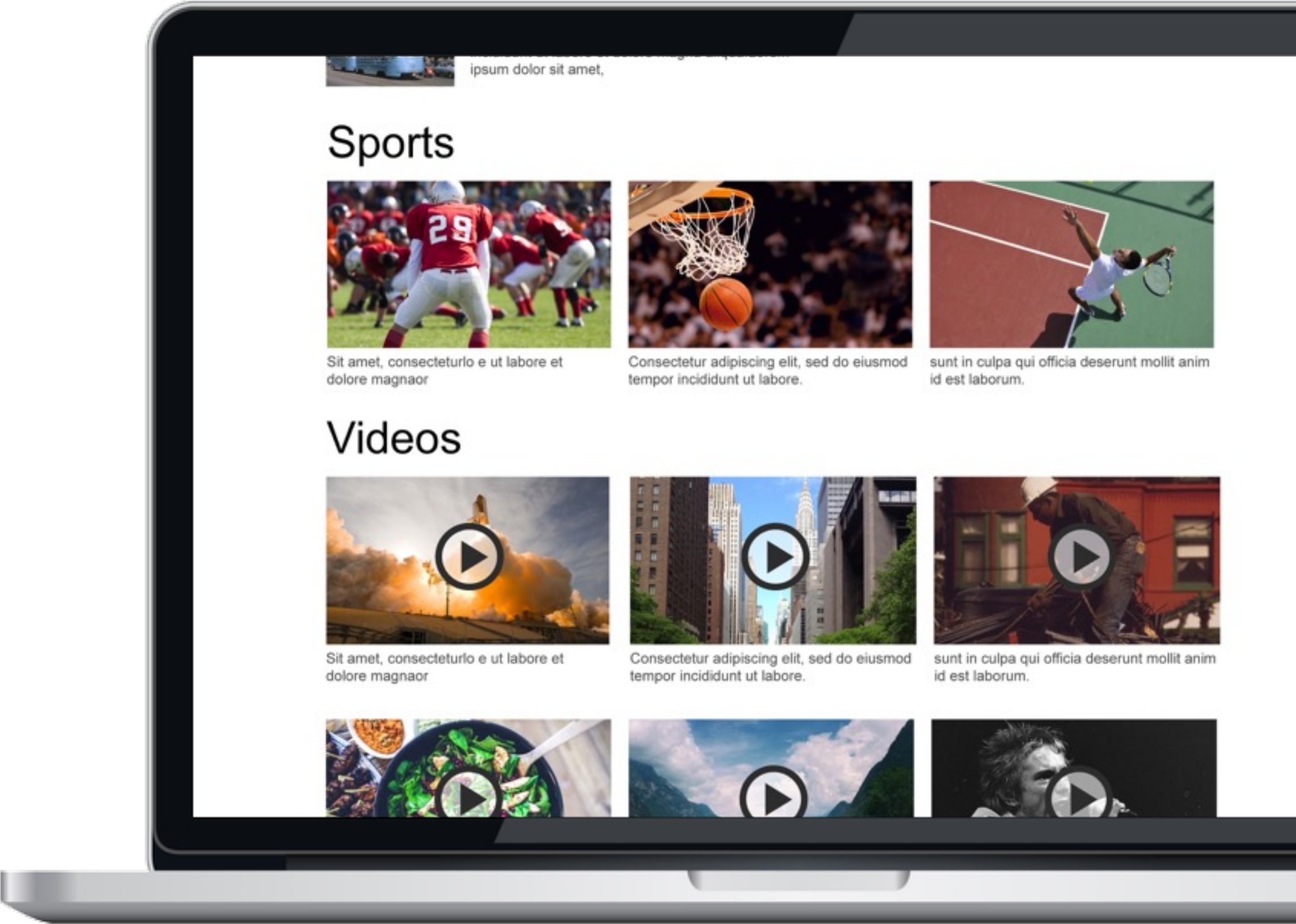
Show extended video section

X% uplift for the cohort

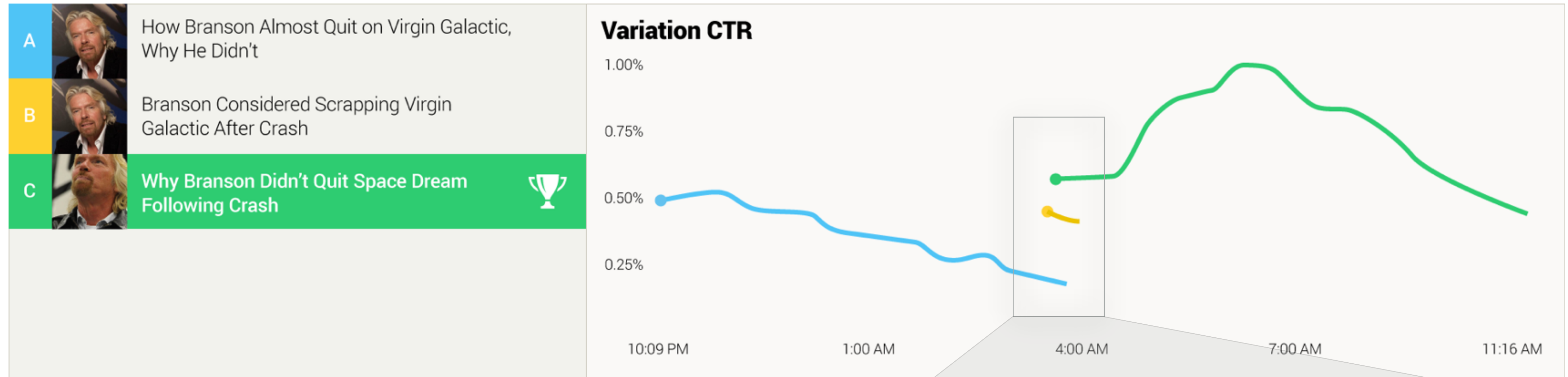
Y% uplift for entire homepage



Change Position



Automated Headline Testing



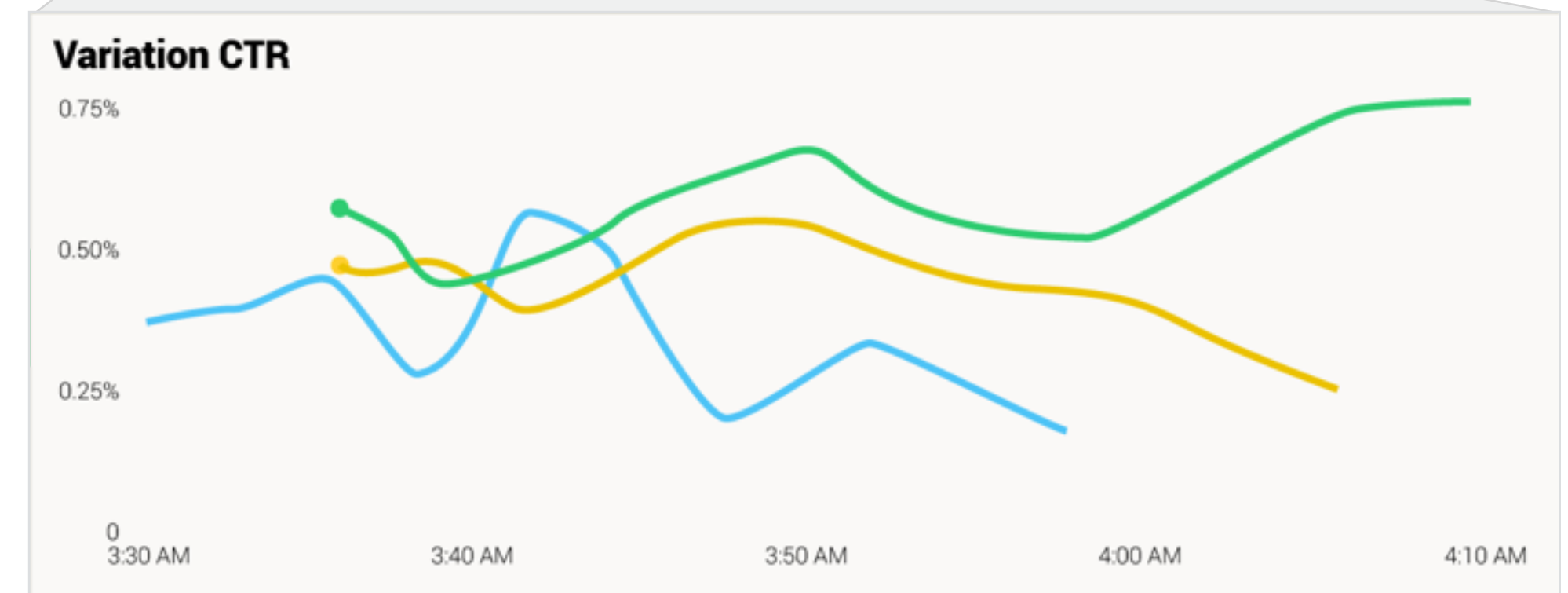
256% uplift (+6,493 page-views)












10M

Average Test Value = \$25

30 Tests / Day -> \$275,000 / year



Article Pages


User Type		Homepage / Sidedoor
		New / returning
		Topical Interests
User Persona		Social sharing
		scanner / reader
		bouncer
User Value		RTB value > \$10 CPM?
Traffic Source		Mobile
		Desktop



Article Pages

 Homepage / Sidedoor

 Social sharing

 RTB value > \$10 CPM?

 Desktop





DYNAMIC YIELD

Buzzfeedness

1. Algorithm decides

Native ads

1. Algorithm decides

AB TEST

1. Algorithm decides

[slide about native ads?]

Audience Development

1. Retargeting

House ads automation

1. Algorithm decides

Social

1. Algorithm decides

Thank You



About Me



Content selection

News site with 100M+ homepage views



Content feed



Score

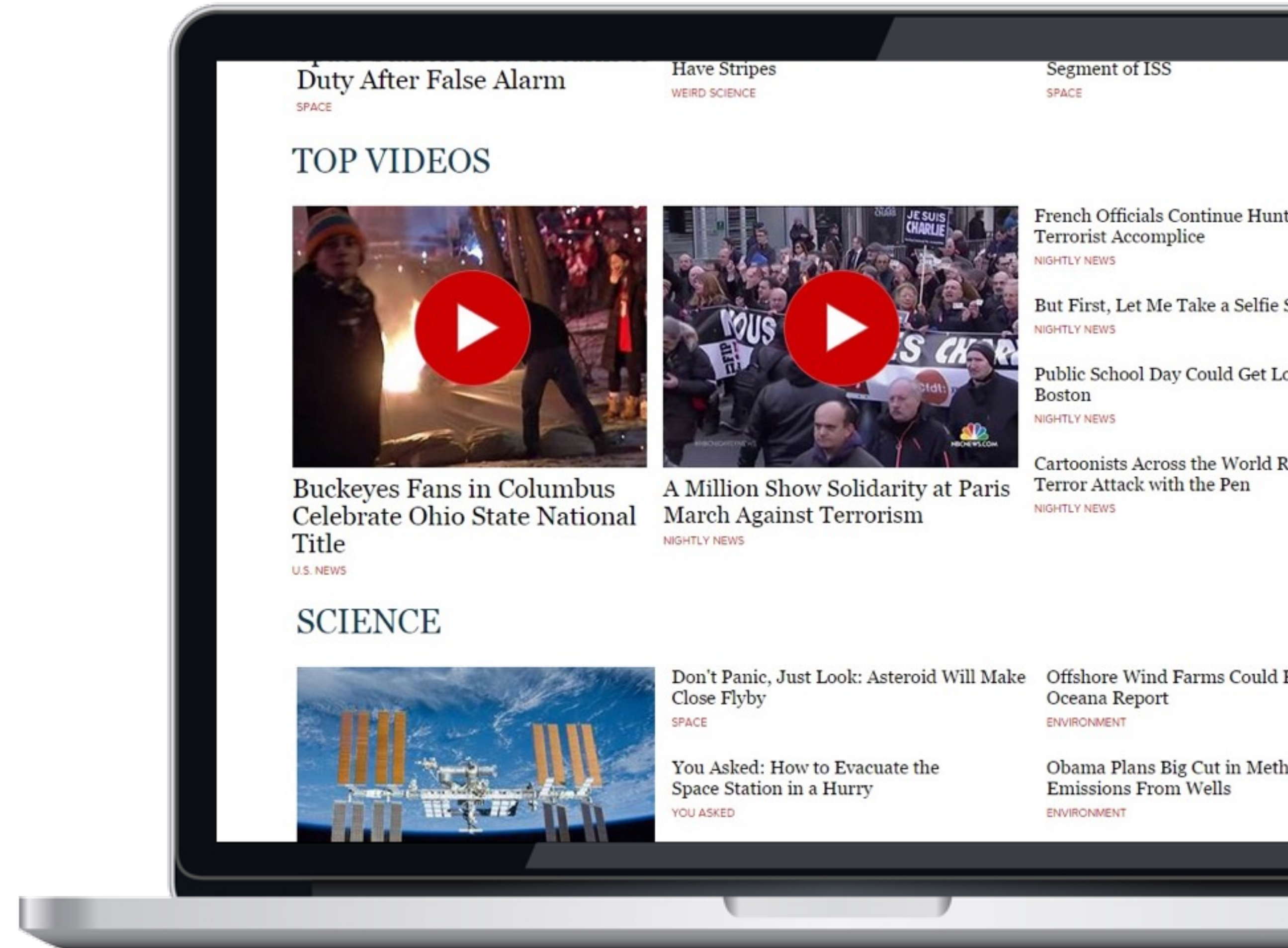
$\text{page-views} / (\text{age} \wedge \text{gravity})$



Freshness threshold



Contextual Bandit Algorithms

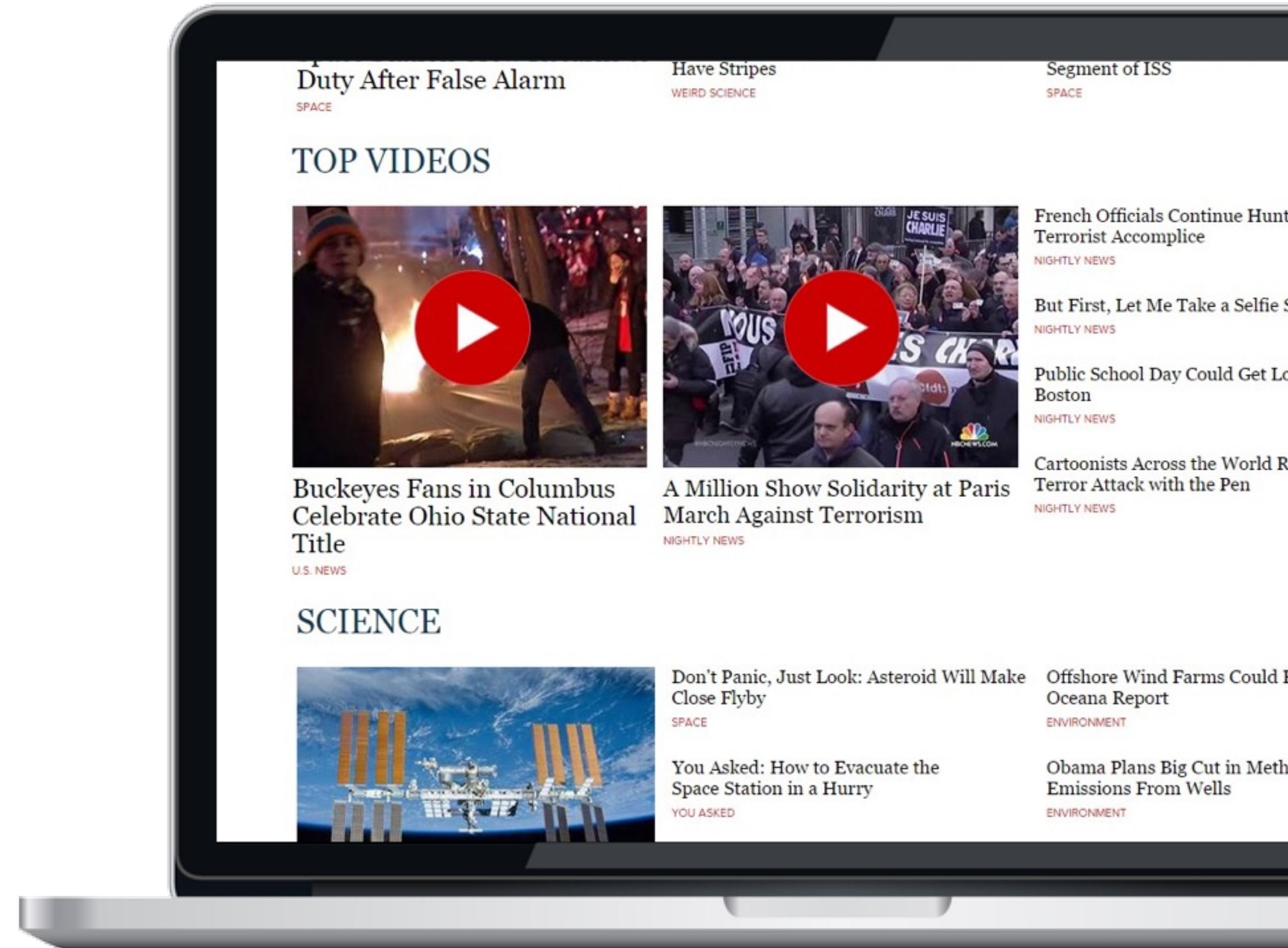


Content selection

News site with 100M+ homepage views

Result:

CTR: 0.34% → 0.923% · **2.7X** uplift



Content selection – Phase 2

Choose an audience segment.

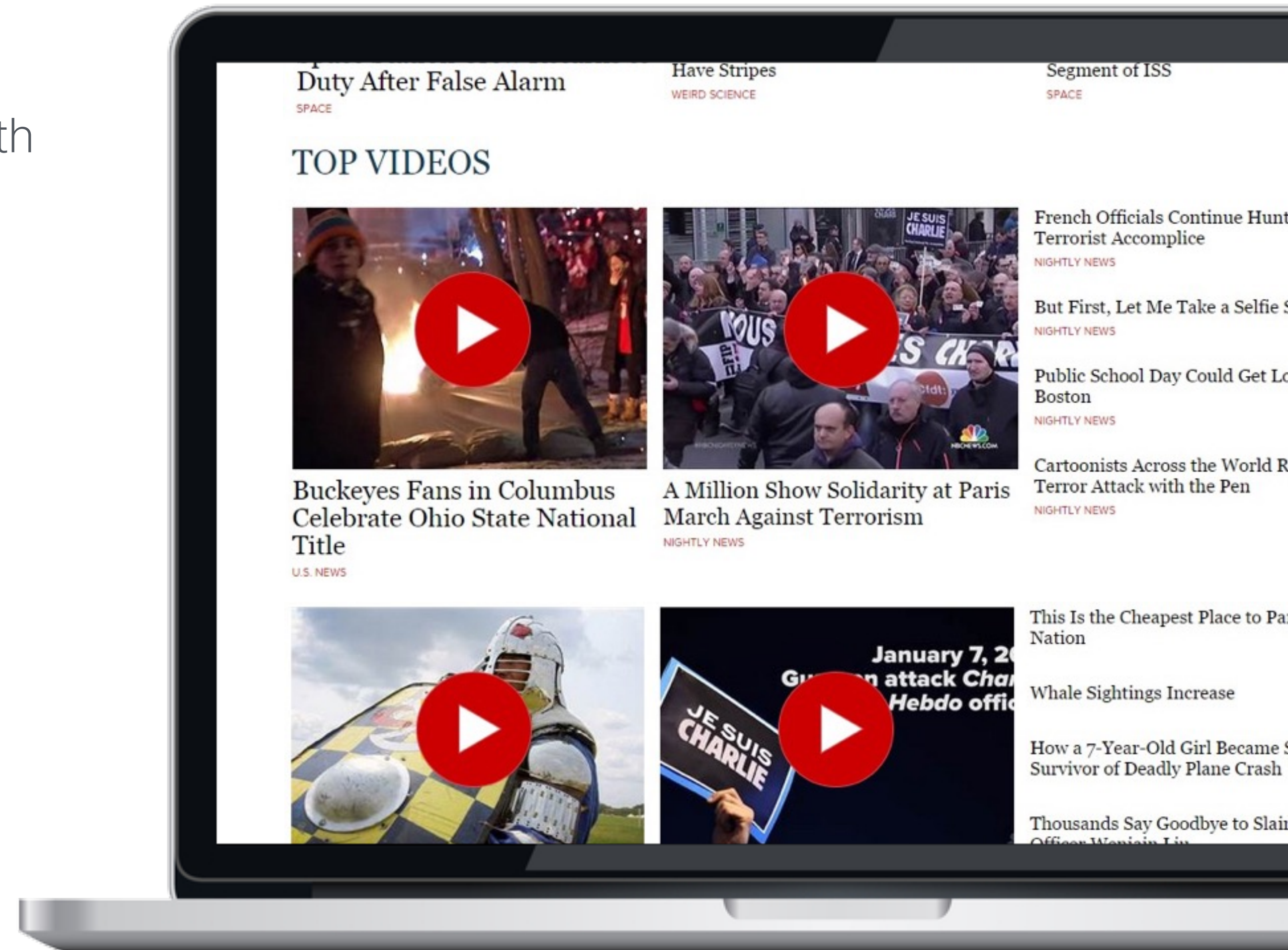
Example: users who view more than 3 videos / month
(16% of total users)



Show that cohort an extended
video section with 12 stories.



Result: X% uplift for the cohort.
Y% uplift for entire homepage.



10% of users (2M) generate 75% of video views; \$300,000

41,240 users (0.2%) generated

3,774,643 (15%) of videos. at \$15

CPM, 41,240 users = \$56,610