smaato



Digital Advertising Trends Report

A look back at the first half of 2020 through the first half of 2021 – and a look ahead at what's to come.

Table of Contents

Executive Summary 3
Introduction <u>4</u>
A Note on COVID-19 Recovery – And Some Predictions <u>4</u> Growth by Vertical <u>5</u>
OTT/CTV
General Trends20OTT at Smaato24Strategy Shift: From Garnering Clicks to Delivering Experiences28
Innovative Ad formats <u>29</u>
 Deep Linking and Splash Ads Shoppable Ads Rewarded Video Outside of Gaming Programmatic Auctions
Overview In-App Bidding on the Rise <u>40</u>
Privacy, Increased User Controls, and Transparency
The Crumbling Cookie43• iOS 14.545• SKAdNetwork Attribution46• Android 1247• Campaign Attribution and Measurement48First Party Data Power49• Audience Targeting50
Ad Fraud Protection and Prevention: Support from our Partner, GeoEdge 52
Conclusion 55

Executive Summary

Welcome to our 2021 Trends Report! We are excited to share key insights into the digital advertising landscape, across a variety of channels and devices.

Combining industry research with Smaato's own proprietary data and insights, we've seen clear themes emerge from 2020 into 2021.

A shift to delivering experiences delivers results. A renewed focus on delivering outstanding user experiences drives ROI for publishers and marketers alike. Innovative ad formats, advanced audience segmentation, and contextual targeting helps improve UX and brand sentiment while driving higher eCPMs.

Demand for OTT/CTV soars. In video's latest evolution, streaming via the internet continues to gain major momentum. While ample solutions exist for publishers to monetize their OTT/CTV inventory, selecting the right partner for OTT is critical for ensuring long-term success, eliminating third party vendor costs, reducing the risk of OTT ad fraud, and delivering positive viewer experiences. A rise in AVOD (ad-supported video content) is likely spurred on by the plethora of subscription services on the scene, and more conscious spending post-pandemic.

More info, more power. Private programmatic bidding gains traction. As the need for transparency becomes crucial for privacy law compliance, in-app bidding adoption is accelerating. Plus, header bidding for mobile offers a powerful alternative to traditionally unfair waterfall auctions.

Evolving privacy regulation drives change, and paves the way for first party data to reign. As cookie crumble and privacy laws evolve, first party data management will become a top priority – and leveraging this data, a key opportunity.

Plus, we'll share a quick analysis of growing verticals in light of the COVID-19 pandemic and its impact on the digital advertising industry.

Note: H1 will refer to the first half of a given year, January through June.



Introduction

Our report is based on careful analysis of data from the Smaato platform, as well as wider industry trends, topics, and research.

Please note that this report is a snapshot of trends across Smaato's global base of publishers, marketers, and users from 2020 through the first half of 2021; specific data and observations may not be comparable with previous reports.

A Note on COVID-19 Recovery – and Some Predictions

It is near impossible to create a trend report without acknowledging the impact of the COVID-19 pandemic on both the world and on the digital advertising landscape.

Rather than share a look back on COVID-19's negative global impact, we'd like to focus instead on how the pandemic facilitated and fueled certain trends and expedited ad format innovation. If it wasn't obvious before, it's clear now: digital adoption is here to stay.



While recovery rates will differ country to country, variant to variant, the digital advertising world is already showing signs of a robust recovery.

eMarketer predicts a swift post-COVID-19 recovery, with digital ad spending increasing to 455.3B from 2020's 378.16B.

\$645.80\$524.31\$535.60\$335.60\$645.80\$335.60\$58.2%\$60.9%\$63.6%\$65.9%\$67.8%201920202021202220232024Digital Ad Spending

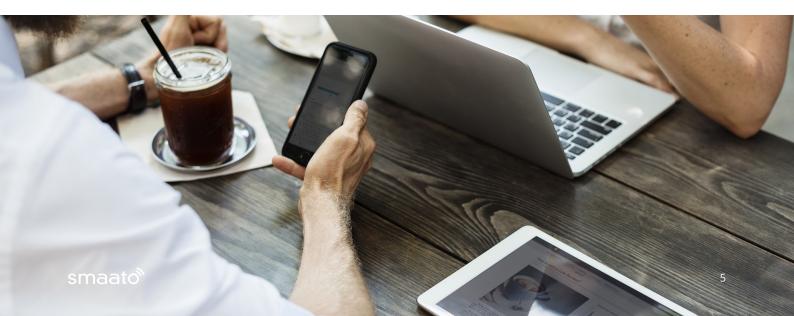
Global Digital Ad Spending Worldwide, 2019-2024

Digital Ad Spending in Billions (USD)

Source: eMarketer, March 2021

At Smaato, we also saw our publishers experience not only recovery, but also a rally. While the pandemic did take an initial hit for publisher revenue, we saw revenue recover steadily throughout the end of 2020, before spiking in 2021.

Ad revenue dipped in March of 2020 as the pandemic extended its reach, but ad spend adjusted and adapted quickly: April 2020 onward shows a steady climb. By July, ad spend began to **outpace 2019**.



Global Ad Spending on the Smaato Platform

2019 vs. 2020 vs. 2021



Source: Smaato Publisher Platform, 2021

Much of this recovery can be attributed to a general shift from the physical to the digital world as a result of global shutdowns. The continued success, however, is a bit more nuanced. As 2020 altered how many work, socialize, relax, and connect, the reliance on digital tech has grown, leading to a much more plugged in, connected world population.

In H1, we saw eCPM increase globally YOY by 7.4% at Smaato.

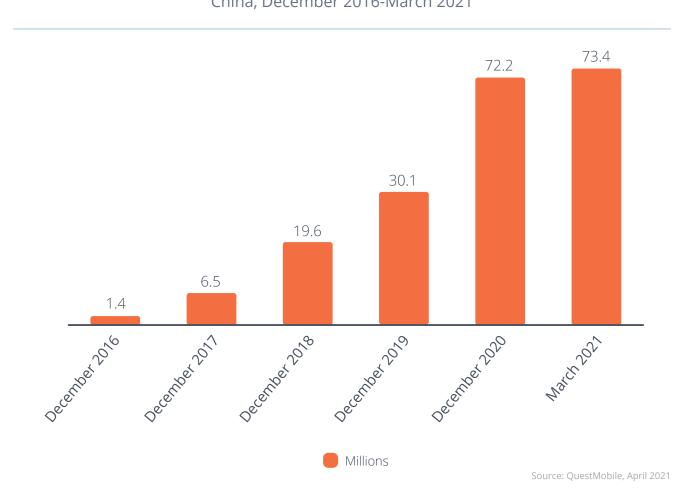
Digital Adoption

The dependence on screens for business, socialization, and of course, entertainment, created a boom in the time spent engaging with apps, sites, and streaming platforms. Simply put: screen time increased.

In a PwC survey, 66% of respondents indicated that they were using their digital streaming devices more as a result of stay-at-home orders, while 71% of respondents agreed that their smartphone use was up.¹

¹ PwC Consumer Intelligence Series, July 2020

In China, digital-communications app WeCom's monthly usage more than doubled, exceeding 72 million users in December of 2020, compared to 30 million the year before.

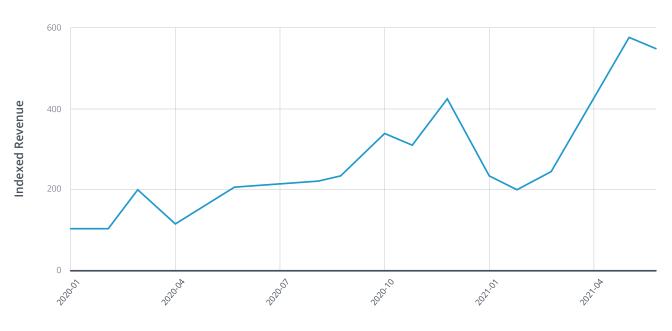


Monthly Active WeCom (AKA WeChat Work) App Users China, December 2016-March 2021

The workplace transformation, spurred on by remote working during the pandemic, completely expedited WeChat's growth.

The trend is mimicked with similar collaboration tools. While many are subscription based, they do offer some opportunities for digital marketing initiatives. For example, PWC predicts that mobile web ads will represent \$117 Billion by 2024.²

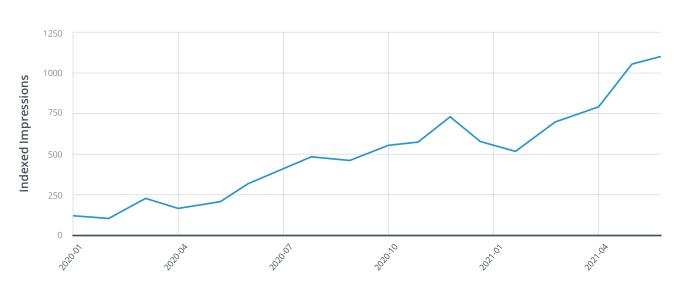




Indexed Revenue for Mobile Gaming Apps on the Smaato Platform

Source: Smaato Publisher Platform, 2021

Indexed Impressions for Mobile Gaming Apps on the Smaato Platform



Source: Smaato Publisher Platform, 2021

While growth accelerated in 2020, the trend continues well into 2021, suggesting a shift in user behavior. (These games can be habit-forming, after all.)

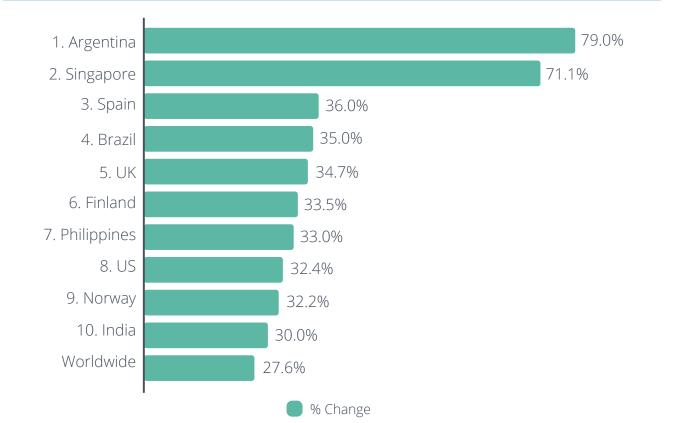
Ecommerce

As brick-and-mortar retailers began to shutter their businesses, online ecommerce experienced a significant boon. Globally, ecommerce spend reached a whopping \$861 billion in 2020, up from \$598 billion in 2019.³

Ecommerce Sales in 2019 \$598 Billion⁴

Ecommerce Sales in 2020 \$861 Billion⁵

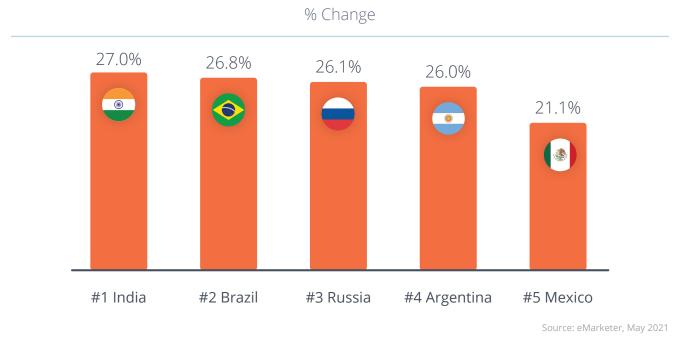
Top Ten Countries Ranked by Retail eCommerce Sales Growth 2020



% Change

Source: eMarketer, December 2020

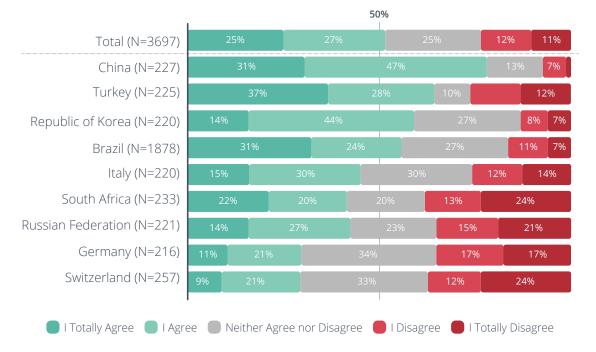




Top Five Countries Ranked by Retail eCommerce Sales Growth 2021

While ecommerce was already trending, the significant change in routine, ease of access, and relative safety of shopping online resulted in a major acceleration.

Consumers in Emerging Economies Saw Greatest Shifts to Online Shopping

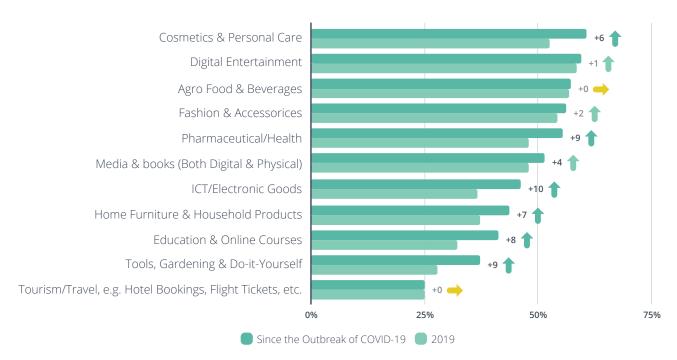


"Since the outbreak of COVID-19, I am shopping more often online than before."

Source: The United Nation Conference on Trade & Development, January 2021

In 2020, online purchases in most product categories rose, up to 10%.⁶

Number of Online Shoppers Increased for Most Products Due to COVID-19



% of Active Shoppers Making at Least One Online Purchase Every 2 Months.

Source: The United Nation Conference on Trade & Development, January 2021

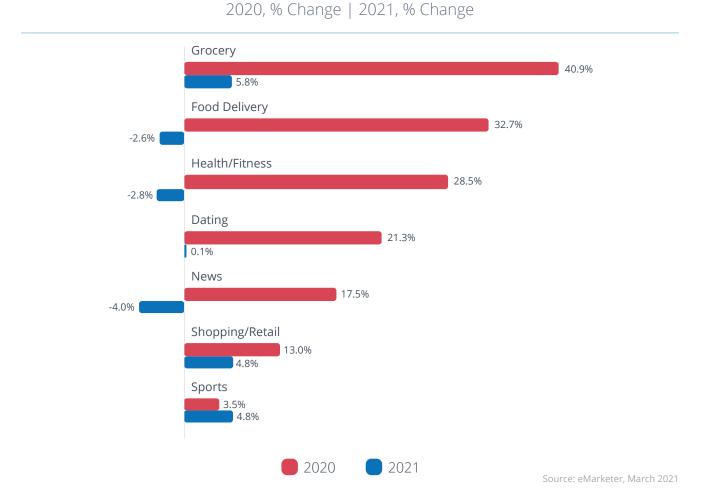
We believe this trend will continue.

Online shopping is also gaining major traction on mobile devices, particularly under social networking's influence. (For example, being able to shop directly from an Instagram ad.) Rather than completing a purchase elsewhere, shoppers can easily checkout from their device, and go right back to engaging with the publisher's app. As the convenience of online shopping and marriage of ecomm and social networks flourishes, mobile digital ad spend will follow suit, too. And we're not alone: eMarketer predicts that worldwide, nearly 75% of all digital ad spend will be focused on mobile by the end of 2021.⁷



Health and Wellness

Fitness and wellness apps similarly experienced tremendous traffic growth in 2020 and beyond. With gyms closed, and months of lockdowns changing daily routines, the demand for at-home fitness options skyrocketed. In fact, spend for on-demand fitness grew more than 129% since 2017.⁸



Smartphone App User Growth by Type US, 2020 and 2021

The increased demand for at-home fitness led to major opportunities for marketers – and spend reflects it. At-home fitness companies spent more than \$280 million in advertising in 2020.⁹



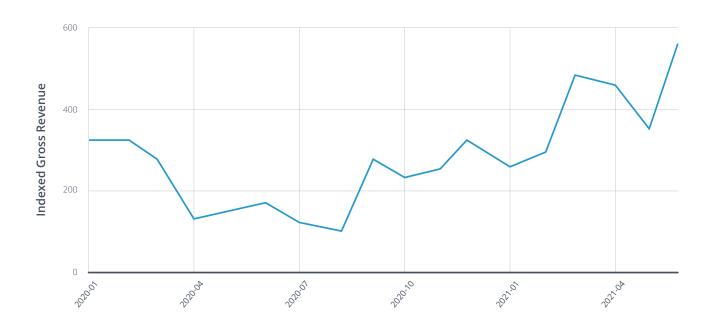
"The explosion of home gyms and the desire for professional, on-demand workouts has sparked a gargantuan increase in health and fitness app downloads.

Americans are increasingly streaming exercise classes from their phones and smart TVs and tracking an array of personalized health metrics brought to life through ecosystems of gadgets and dashboards."

> Hamza Shaban For the Washington Post¹⁰

Health & Fitness App Gross Revenue

Worldwide, 2020 - H12021



Source: Smaato Publisher Platform, 2021

¹⁰ The Washington Post, January 2021

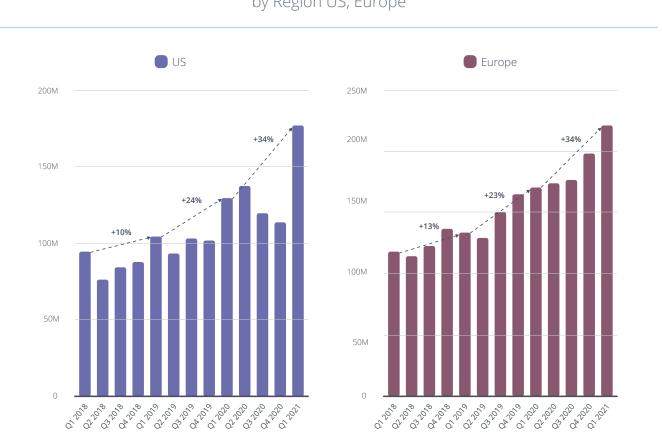
Fintech

Yet another category, financial technology (or Fintech), saw a huge surge during 2020. According to AppsFlyer, financial and banking app downloads spiked by as much as 132% globally.¹¹

With banking customers stuck at home, and financial-service employees working remotely, the need for at-home banking options became more crucial in 2020-2021.

Additionally, global uncertainty, high rates of unemployment, and fluctuating stock prices created a demand for stronger financial literacy and quick insights, which finance apps can provide. Amidst times of uncertainty, these apps were able to help users gain more control over, and transparency into, their finances.

In the US and Europe, financial app installs grew a whopping 34% YOY in Q1 of 2021.¹²



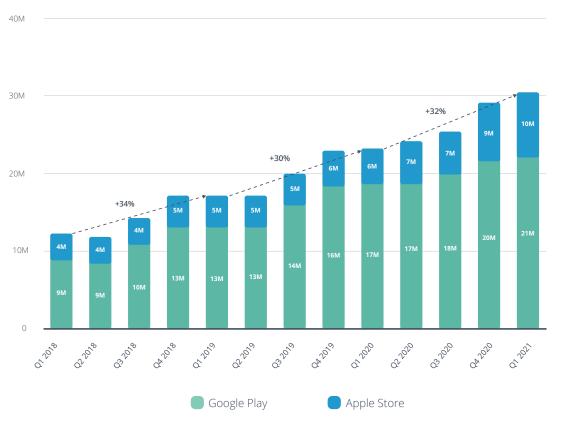
Quarterly Download Growth for Financial Apps by Region US, Europe

Source: Sensor-Tower, March 2021

As the need to limit time indoors and to cut back on physical contact grew, so did the reliance in many places on contactless payment options, driving up downloads of payment apps like PayPal or Google Pay.

¹¹App Business, June 2021 | ¹² Sensor-Tower, March 2021

Quarterly Downloads of Top Digital Payment and Money Transfer Apps



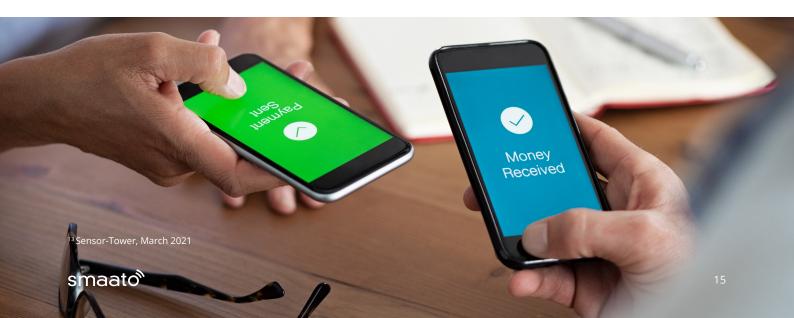
Europe, Q1 2018-Q1 2021

Source: Sensor-Tower, March 2021

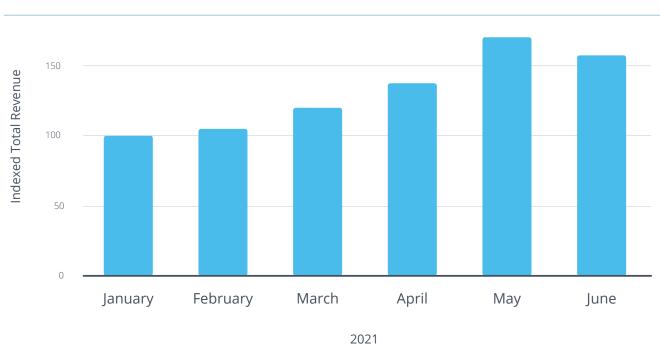
Investment opportunities, current events, and headlines about cryptocurrency further drove downloads for investment apps (like Robinhood) and cryptocurrency apps (like Crypto.com and Pi Network).

These types of apps accounted for seven out of ten of the top finance app download growth (quarter over quarter) in the US – eight out of ten in Europe.¹³

Altogether, these factors helped drive Fintech app popularity.



We see this trend at Smaato, too, with continued growth for Fintech ad revenue stretching into 2021:



Indexed Total Fintech Ad Revenue on the Smaato Platform

Worldwide 2021

Online Grocery Shopping

For 2020 specifically, online grocery shopping also saw tremendous growth as shoppers opted for both safety and convenience by shopping from home. This major shift towards online grocery purchasing "accelerated growth in US ecommerce channel advertising to 49.8%."¹⁴ As restrictions ease, some shoppers may return to stores, while others may have found that the "found time" and fewer physical shopping trips will keep them engaged with online grocery delivery.

Source: Smaato Publisher Platform, 2021

As new meal kits enter the scene and additional personal shopper apps can keep customers out of the aisles, ad spend may well continue as the need to incentivize households to shop from home increases.



As recovery continues (at varying rates, country to country), we expect that many of these learned digital media behaviors will stick. Opportunities continue to arise for publishers and marketers alike as audiences rely more heavily on screens for nearly every facet of modern life.

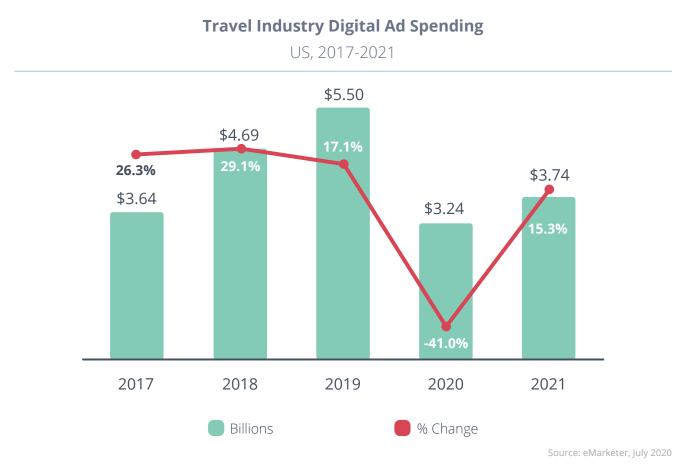
With economic recovery gaining at a faster rate than previously anticipated, global ad spend is also expected to increase:

Worldwide, 2021-2025 \$1,007.66 \$747.67 \$324.29 \$1,007.66 \$201 202 2023 2024 2025

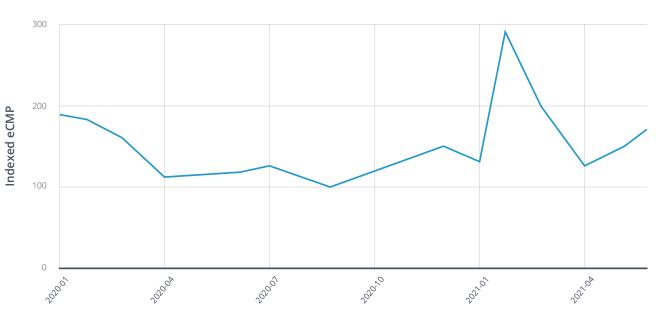
Total Global Media Ad Spending

Source: eMarketer, March 2021

We must also consider advertising verticals that were more negatively impacted by the pandemic (like airline travel and hotels) are on a different road to recovery. As can be expected, the travel industry digital ad spend took a nose dive in 2020, but as this example from the US shows, it is already well on the way to recovery as vaccination rollouts continue.



We saw a similar dip globally in 2020 eCPMs for travel-related inventory globally. In early 2021, as vaccines became more widely available, we noticed a spike in eCPMs and ad requests, and following the initial spike, a steady increase.



Indexed eCPMs for Travel Inventory on the Smaato Platform Globally

Source: Smaato Publisher Platform, 2021

We expect these verticals to soar as restrictions continue to ease.



OTT/CTV

In the last year, OTT and CTV continued to gain momentum in both user adoption and as an advertising vertical.

Did You Know?

OTT stands for over the top, and is used to describe video that streams over the internet, instead of via satellite or coax cables. OTT encompasses CTV, too.

CTV, or connected TV, simply refers to any TV that can stream content via the internet, whether a Smart TV with built-in internet, or a connected device like a PlayStation or Roku.

Unsurprisingly, the demand for quality at-home entertainment was high in 2020. As a result, streaming content became paramount (no pun intended).

By 2025, OTT TV & Video Subscriptions will reach

2 Billion

globally,

driven from traditional TV subscriptions. That's nearly 25% of the world's population.¹⁴ IAB reports that in the US, experts suggest that "digital adoption increased in a matter of weeks rather than an anticipated 3+ years to reach the same scale."¹⁵

Marketing trends reflect consumer adoption, too. OTT/ CTV is already disrupting the 70 billion dollar industry.

CTV Programmatic Display Ad Spending



US, 2019-2023

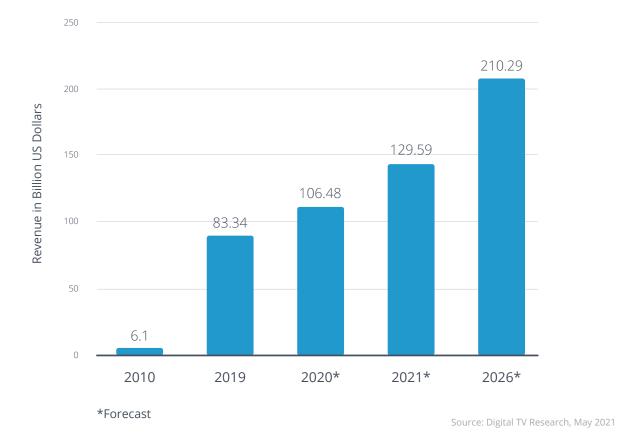
Source: eMarketer, April 2021

The money is shifting from traditional, linear TV to OTT (and by extension, to CTV). In fact, IAB predicts that in 2021, the average budget shift from Linear to OTT/CTV digital advertising is as much as 21% among digital media buyers.

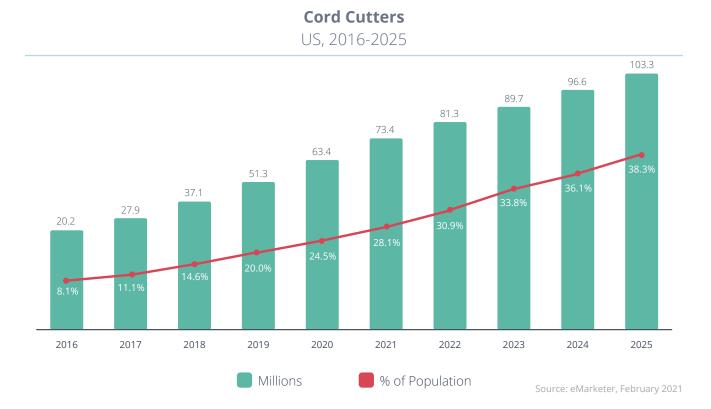
Worldwide, OTT is expected to generate \$210 billion USD in 2026 – almost exactly twice what it generated in 2020.

¹⁴ Karlene Lukovitz, December 2020, 2 Juniper Research, January 2021 | ¹⁵ IAB Outlook, March 2021

OTT Revenue Worldwide 2010 to 2026



In the US, "cord cutters" may account for as many as 38.3% of the population by 2025. The trend away from paid cable or satellite TV is gaining outside the US, too, and provides ample opportunities to monetize content and reach engaged audiences.



Did You Know?

Cord Cutters: Viewers who are dropping cable or satellite, and moving over to OTT.

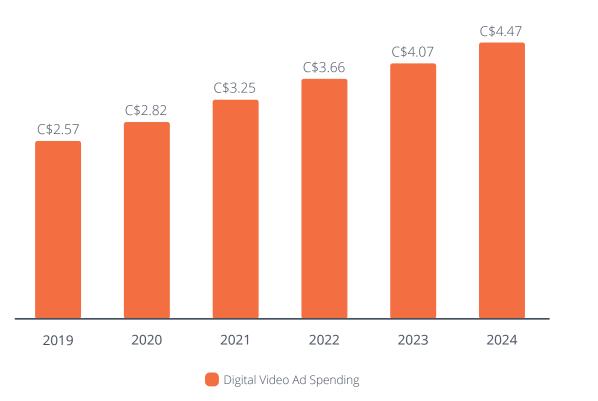




Cord Nevers: Viewers who have always watched TV via OTT, with no cable or satellite subscriptions.

Digital Video Ad Spending Canada, 2019-2024

Digital Video Ad Spending in Billions of C\$



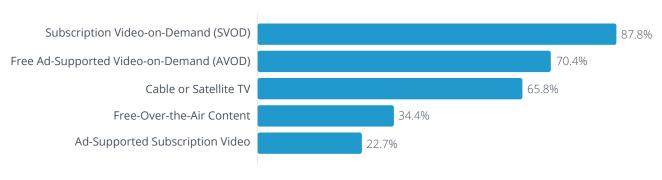
Source: eMarketer, March 2021

In Canada, for example, digital video ad spend exceeded TV ad spend for the first time in 2020.¹⁷

¹⁷ eMarketer, May 2021

Types of Video Content Watched by Internet Users Latin America, March 2021

% of Respondents n= 1,200 ages 18-50



Source: EMI Research Solutions, March 2021

While the shift from Linear TV to OTT continues to make headlines, there are other trends within the OTT/CTV landscape that are worth noting, as well. Specifically, the shift from subscription-based models (like Netflix) to ad-supported or hybrid models (like Hulu and YouTube). This provides a huge opportunity for monetization and for advertisers worldwide.

While strained wallets may account for some of the increase in demand for ad-supported video on demand services, another theory may be that the sheer volume of subscription options available is making monthly subscriptions untenable. Viewers must either choose to subscribe to a select few (and miss out on new content from other players) or pay a smattering of monthly bills to maintain a wide variety of platforms.

Did You Know?

AVOD: Ad-Supported Video On Demand. AVOD platforms include free, ad-supported platforms like YouTube, and hybrid models like Hulu.

SVOD: Subscription Video On Demand. SVOD platforms rely on a monthly subscription fee and share commercial-free content. While Amazon Prime is a SVOD service, IMDBTV content is AVOD.

Spurred on by additional platforms, like Peacock and the infamous Quibi, which joined a plethora of new video on demand services (including AppleTV+, Discovery+, Disney+, and HBO Max, which launched during the past year), the demand for ad-supported video content is on the rise. As a result, subscription services are feeling the pain. For example, even Netflix's revenue took a hit in the US. Emarketer predicts that Netflix will corner less than a third of US OTT subscription revenue (30.8%) in 2021, down from 36.2% in 2020, and 44.4% in 2019.¹⁸

With a saturated – and fragmented – landscape, AVOD content helps give viewers access to quality content without the hefty monthly expense.

Some streaming services, like Hulu, are taking a slightly different approach. They are leveraging a hybrid model, offering subscriptions for partial ad-free content, while also granting access through an ad-supported revenue model for those who don't want to add another subscription to their monthly bills.

TREND ALERT

OTT and CTV will continue to dominate, as they tackle the \$70 Billion TV ad industry. **We expect that as 5G sweeps the globe**, lightning fast streaming speeds, reduced latency, and better quality on the go will further fuel OTT's success.

OTT at Smaato

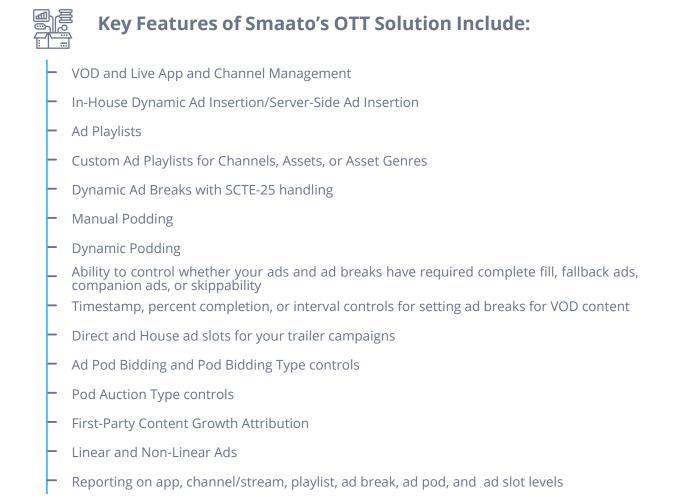
We launched our holistic OTT Platform, and set out to solve some of the issues plaguing the industry.

Independent Solutions

In our experience, publishers want an independent solution. What does this mean? Rather than a solution that is also in the business of acquiring content, publishers are seeking opportunities to partner with companies that allow them to retain their independence while still monetizing their inventory.



Smaato is in the business of helping publishers monetize their inventory – not acquiring it. Our independent solution gives publishers complete control over their content and inventory.



SSAI Fraud Prevention

Server-Side Ad Insertion (sometimes called Dynamic Ad Insertion, or DAI) comes with key benefits, like reduced latency, ad quality matching content quality, elimination of buffering, and contextual placement opportunities.

But it also comes with risk.

Hackers can pose as server-side ad insertion entities and reach out to servers, pretending to stitch ads on behalf of reputable, real publishers. When they send out an ad request, they confirm that they will stitch ads into the content. While they fail to actually stitch ads in, they do send measurement events, like impressions, back to the ad server. In some cases, they can even inject their own beacons into real ads, resulting in a larger payout for themselves with each impression event.

At Smaato, we neutralized this threat completely. How? We do all our SSAI/DAI in house. Without the third party, there is no risk of third party fraud.

SSAI Cost Elimination

We've spoken with many publishers who have expressed not only a concern about fraud with third-party SSAI solutions, but also the expense. Farming out dynamic ad insertion to a third party isn't free, after all.

We're proud to offer our in-house dynamic ad insertion at no cost.

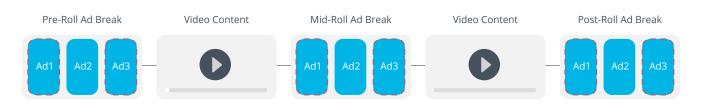
Serving Commercial Breaks

We believe publishers should be able to choose exactly how they monetize their ad placements. With the Smaato platform, we make that easy.

The Smaato platform now allows publishers to serve commercial breaks, complete with multiple ads via ad podding.

Ad pods are groups of ads played back-to-back, just like a commercial break on TV.

Each ad pod consists of multiple ad placements, called ad slots.



Publishers can choose ad slot duration for VOD content, and get complete control over how they define their ad breaks.

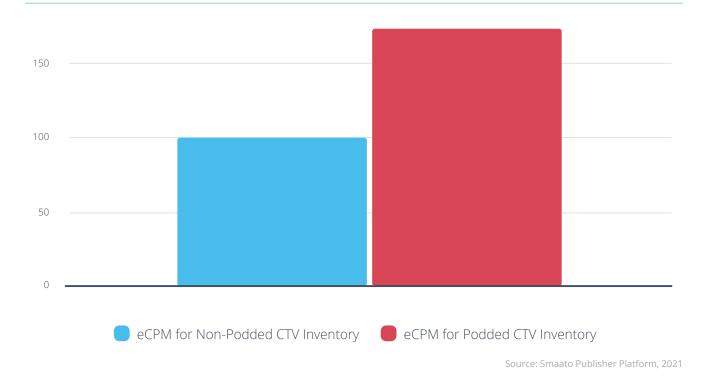
Broadcasters get to define ad breaks for live content, and ensure consistency across platforms and streaming services.

For VOD content, Ad Pods can be constructed manually or dynamically. Live content is filled dynamically, with user context top of mind.

One publisher, who migrated on our platform from serving video ads (via instream adspaces) to serving ad pods (via instream ad breaks), saw a **60% increase in revenue**, while auction win-rates nearly doubled.

Indexed eCPM for Non-Podded vs. Podded OTT/CTV Inventory on Smaato's Platform

Indexed before eCPM



Did You Know?

Smaato supports both linear and non-linear instream ad pods, so publishers can choose to serve ads as a commercial (linear) or as an overlay on top of video content (non-linear).

To learn more about OTT/CTV, check out our complimentary eBook: OTT/CTV Advertising. <u>Get your free copy</u>.

"Since we started using Smaato's OTT Platform our content monetization has improved significantly, the fill is high (~85-97%)! They give us the ability to control content experiences and demand sources on both the commercial break and individual commercial level, as well as allow us to sell our inventory as commercials or as pods. Smaato's solution is perfect for any type of OTT publisher, developer, broadcaster, or network!"

> Tony Kandah FlixHouse



Strategy Shift: From Garnering Clicks to Delivering Experiences

For years, KPIs like click through rate (CTR) or impressions dominated how brands measured success. But as ad formats evolve, strategies and goals shift, too. "Delivering engaging experiences" is more than just a handful of buzzwords: it is a strategic push that helps both publishers and marketers.

After all, crafting positive user experiences improves brand favorability ratings (for both publishers and brands). Giving users/viewers more control over their advertising interaction and delivering more tailored experiences helps improve brand sentiment. Integral Ad Science found that delivering more relevant ads improves favorability by 107%.¹⁹

That favorability translates to likelihood to make purchases or further engage with advertising content.

¹⁹ IAS Integral Ad Science



This is especially true when it comes to ecommerce, and innovative ad formats are generating new KPIs. Rather than clicks or impressions, we can now get a better understanding of user behavior. What items were browsed? Which ended up in the cart? What did people actually buy? The growing spend for ecommerce further reflects these predictions, as digital buying gives way to better audience insights.

US ecommerce sales are expected to grow 17.9% this year to reach \$933.30 billion. Ecommerce is now on track to surpass 20% of total retail by 2024.

Source: eMarketer, June 2021

There are a few trending ad formats that are making it easier to deliver tailored user experiences, while helping to combat "banner blindness."

The need to drive outcomes for digital ad players is amplified by consumer experience shifts that create the opportunity to align what is right for the industry with what consumers expect — relevant, nondisruptive and personalized advertising.²⁰

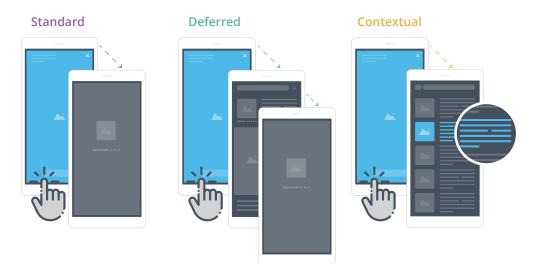
²⁰ IAB Outlook<u>, March 2021</u>

Deep Linking and Splash Ads

Instrumental in delivering these customized, cohesive user experiences are deep links and, similarly, splash ads.

Deep linking can work in three different ways: standard, deferred, and contextual.

When a user clicks a deep-linked ad and already has the app, the **standard deep link** triggers. The user goes from the ad directly to the landing page of the app. **Deferred links** will also open the launch screen of the app, but only after the user downloads the app from the App Store or Google Play.



Contextual deep links are unique in that they can drive users to specific pieces of in-app content and information, even to hyper-relevant search result pages. For example, if a user clicks on an ad about a vacation stay they want to book, their hotel app will launch on a preloaded search page for a hotel in a specific area.

This is where that user experience piece really comes into play. Instead of ads taking the user out of one experience and dropping them into a new environment, these contextual deep links bring users to specific, pertinent content, giving them access to a useful, engaging, new experience.

With user privacy top of mind, we ensure that all deep linking at Smaato is privacy-safe and iOS 14.5 compliant. Marketers get strong attribution information without relying on device or user information.

Splash ads are full-screen, eye-catching interstitials that fill an app launch screen as the app content loads. These ads deliver high engagement with easy-to-measure viewability.

Splash ads typically play for about five seconds, and must include a close/skip button after the first three seconds, to deliver an unobtrusive user experience. The option to close or skip the content gives users more control over their experience.

With deep linking functionality, now splash ads can also deliver users directly to a specific piece of in-app content.

Splash ads initially gained major popularity in China, but are catching eyes around the world these days. Marketers rely on splash ads for their strong visual impact, and publishers favor them for the high eCPMs they generate. Plus, ad quality tends to be higher for splash ads, which helps brand image. In fact, some companies see nearly three quarters of their revenue coming from these high-performing ads.

Shoppable Ads

While shoppable ads are relatively new on the scene, some have already gone so far as to call them the "future of commerce."²¹ Shoppable ads let users directly purchase the product featured in the ad. These video or image ads have embedded tags that link directly to the product's page on the marketer's website.

It sounds simple, but the result gives consumers an instantly gratifying and seamless shopping experience, boosting engagement and delivering a positive customer experience.

We've seen ecommerce spike during the pandemic; shoppable ads can build on that momentum. Users are already comfortable shopping from the comfort of their homes and on mobile devices.

Integrating an interactive experience – and thus turning a passive ad-watching experience into an active participation exercise – drives up both engagement and retail sales.

Already, Facebook and Instagram have leaned into shoppable ad content, giving users a chance to engage with ad creative, and directly mimic influencers' style, aesthetic design, and even travel experiences with a few quick clicks. In a recent survey, almost half of all respondents reported having made at least one purchase via social media.²²



Shoppable ads, including both online display and video, represent that shift towards generating experiences for users. In this case, an online shopping experience, the experience of actively participating with a brand, and, ultimately, delivering a lifestyle experience.

We fully expect that shoppable ads will further gain momentum, especially with shoppable video, given OTT's upward mobility. Our platform is shoppable-ad enabled, and available across all formats and ad environments – reach out to learn more.

For shoppable video ads, we also predict that context will play a big role. With SSAI/DAI (see page 19 for more details), advertising creative is stitched into existing content. That means that ads can be targeted based on the environment in which they'll appear. For example, during a RomCom, there may be an opportunity to include ads for jewelry, fragrance, or cosmetics, all of which could be shoppable. An ad for an energy drink, athleisure wear, or exercise equipment can be inserted following a scene of the protagonist at the gym.

This not only keeps viewers engaged with the content they're watching by matching the theme, but also encourages ad engagement. With shoppable video ads, viewers can engage with online retail while staying in the mindset of their show or movie.

Rewarded Video for Gaming and Beyond

Rewarded Video ads, or "incentivized video ads," are 15-30 second, non-skippable video interstitials that give users in-app rewards upon completion.

Rewarded Video gained quick popularity in the gaming world, giving users access to new levels, more coins, or extra lives without having to make in-app purchases.

Their popularity is intuitive: users opt in, giving them more control over their experience (and stronger engagement for advertisers). And, they generate rewards to improve the gaming experience.



Universally, users would prefer to watch the ad than engage with in-app purchases.

Would US Mobile Gamers Prefer to Watch Rewarded Video Ads or Pay for In-App Purchases? US, Q2 2020

Gender Female 92.0% 8.0% Male Age 18 - 24 91.4% 8.6% 25 - 34 35 - 44 45 - 54 10.0% 55 - 64 65 - 74 75+ Income <\$50K \$50K-\$99K \$100K-\$149K \$150K-\$199K \$200K-\$249K \$250K+ 94.1% 5.9% 🛑 Watch Ad Pay-in-App Source: DSIQO, September 10, 2020

By Demographic

With such success in the gaming world, there's no reason rewarded ads shouldn't capitalize on other environments, as well. Other verticals can capture a piece of the success, while offering audiences a tangible reward.

For example:

Ad-Free Streaming

Ad-supported content like music apps and video streaming platforms can leverage rewarded video ads to grant listeners, viewers, and users a stretch of ad-free content.

For free-subscription listeners/viewers, opting to watch a longer video ad is an attractive alternative to shorter but more frequent ad interruptions.

Subscriptionless Access

Similarly, news and article publishers can use rewarded video as a way for readers to access gated content. As users look to find information or insights and click through to a paywall, frustration mounts. Those who wish to skip the subscription fee leave the site, driving up bounce rates. This can even translate to a negative brand association. Rewarded video is a simple – and rewarding – alternative.

Publishers can still monetize their inventory and engage with new users by granting access to select articles.

Bonus Features & Discounts

Apps outside the gaming world can also help users enjoy additional features, like unlocking replays for OTT sports apps, accessing exclusive filters for photo editing tools, or gaining additional workout content for fitness apps.

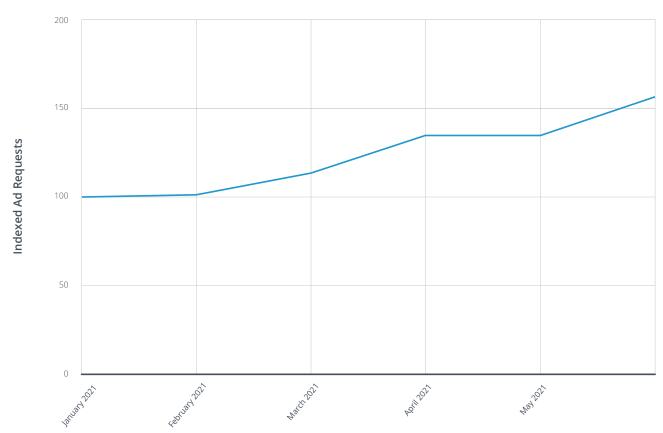
For ecommerce, coupon/promo code rewards or early sale access can keep users engaged with advertising content.

There are endless ways to add value for users while improving engagement and retention, and we expect to see rewarded video's performance continue to accelerate.

Learn more about Smaato's innovative ad formats.

At Smaato, we've seen continued success with rewarded video content. For publishers, this format drives high eCPMs, while marketers get access to engaged viewers.





Worldwide 2021

Source: Smaato Publisher Platform, 2021





Programmatic Auctions

In our 2019 H1 Insights report, we reported on the shift we were seeing on our own platform from open auction spend to private marketplace deals. In fact, we saw in-app ad spending via PMPs rise 250% from H1 2018 to H1 2019.

In 2021, eCPMs for direct marketplace deals (including private exchange and preferred deals) were **18% higher** than for open exchange deals.²³

Programmatic Auction Types

Open Auction (AKA: Open Exchange, Real-Time Bidding (RTB), Open Marketplace, Smaato Exchange)

All marketers on the exchange/SSP/ad network have an opportunity to bid on all available publisher inventory. This is the most traditional form of programmatic auctions.

²³ Smaato Publisher Platform, 2021

Private Exchange (AKA: Private Marketplace (PMP), PMP Programmatic, Private Auction, Invitation-Only Auction)

Like Open Auctions, private exchanges are RTB, but are by invitation only; a single publisher invites a mere handful of marketers to participate.

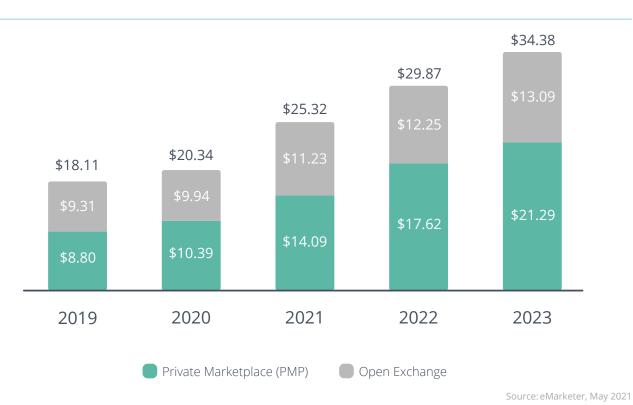
Preferred Deal (AKA: Unreserved Fixed Rate, Programmatic Non-Guaranteed)

In this private, 1:1 relationship between a publisher and a marketer, publishers offer premium inventory to the marketer at a pre-negotiated fixed eCPM price.

Programmatic Guaranteed (AKA: Guaranteed Buy, Programmatic Direct, Automated Guaranteed)

Publishers offer specific, reserved inventory to a marketer at a fixed price. In this direct deal, programmatic automation replaces the manual IO process, improving efficiency and reducing error.

According to eMarketer, for the first time ever, private exchange deals outpaced openauction deals in 2020.



Real-Time Bidding (RTB) Digital Display Ad Spending US, 2019-2023

Billions

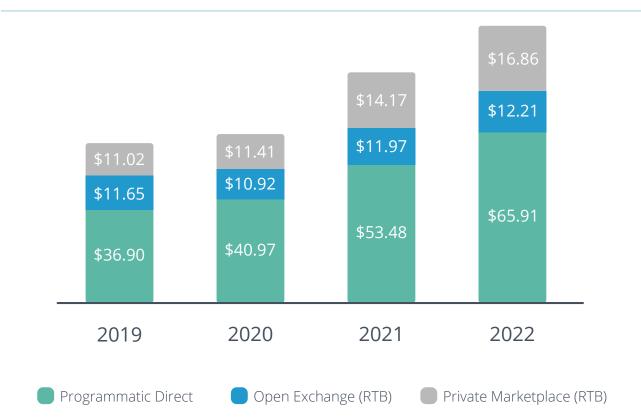
What's driving the shift from Open Auctions? For one, Programmatic Guaranteed Deals, Private Exchange, and Preferred Deals all offer a higher level of brand safety for publishers and marketers.

Secondly, as countries adopt various data privacy laws, the lack of transparency or predictability with the Open Exchange makes more curated deals even more appealing. Programmatic direct deals offer publishers more confidence in advertiser privacy-law compliance.

eMarketer predicts that in the US, China, Germany, the UK, Canada, and France, PMP ad spending growth will outpace open marketplace growth by double or more over the next two years.²⁴ Coincidentally (or not), all six countries will face new or additional privacy regulations in the next 24 months.

According to eMarketer, for the first time ever, private exchange deals outpaced openauction deals in 2020.

Programmatic Digital Display Ad Spending by Transaction Method US, 2019-2022



Billions (USD)

Source: eMarketer, July 2020

As the cookie crumbles (more on that below), Publishers can create audience segments using first party data and use direct or private exchange deals to help marketers reach relevant audiences.

²⁴ eMarketer, November 2019



The Rise of In-App Header Bidding Solutions

To examine the rise of in-app header bidding solutions, we have to look back at how inventory is normally auctioned. Traditionally, publishers offer inventory to partners in sequential order. This waterfall model means that the first bid to exceed the floor price wins. As a result, publishers miss out on potential revenue, and marketers miss out on a chance to bid on relevant inventory.

Header bidding is a real-time pre-auction (which happens in the webpage header while content loads) that enables multiple ad exchanges to bid on the same inventory simultaneously. This unified auction creates a level playing field for marketers, offering a more fair alternative to the traditional waterfall. It also tends to boost eCPMs for publishers. Since all bidders have a chance to submit a bid, the inventory is filled by the highest bid – not just the first bid to pass the floor price.

As the need for transparency becomes crucial for privacy law compliance, in-app bidding adoption is accelerating.

With its many advantages over traditional waterfall solutions, web-based header bidding was quickly embraced by publishers and marketers alike.

Adoption of in-app header bidding (also called "in app bidding," as apps lack headers), however, has been slow.

More recently, changing privacy laws are having an impact (more on that, below). As the need for transparency becomes crucial for privacy law compliance, in-app bidding adoption is accelerating.

We expect the trend towards in-app bidding solutions to continue in 2021 and 2022.

At Smaato, we offer two in-app header bidding solutions: Unified Bidding, and Smaato's Prebid Mobile adapter for Prebid Mobile support.

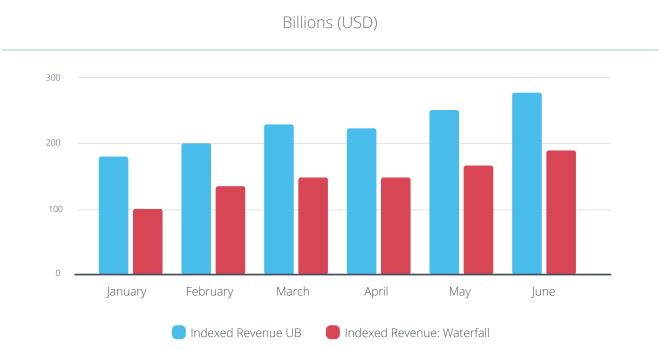
These header bidding solutions help drive top-line revenue, without hurting other channels. For example, in 2021, one publisher on our platform experienced significant QOQ growth as a result of adopting header bidding solutions.

Overall, this publisher experienced a **45% revenue increase across Unified Bidding**, **Prebid**, **and the Smaato Exchange**. 31% of this came from Prebid, while 44% was driven by Unified Bidding. This illustrates how the header bidding solutions did not cannibalize existing channels, and instead only contributed to increased growth via better fill rate and strong eCPMs.²⁵

²⁵ Smaato Publisher Platform, 2021

Unified Bidding

For publishers using Smaato's NextGen SDK, our Unified Bidding solution is already built in. Unified Bidding is a holistic bidding model that uses real-time pricing competition to provide publishers with maximum competition and control over their inventory. It also comes with **Open Measurement** support.



Indexed Revenue Unified Bidding vs. Exchange on the Smaato Platform H1 2021

Source: Smaato Publisher Platform, 2021

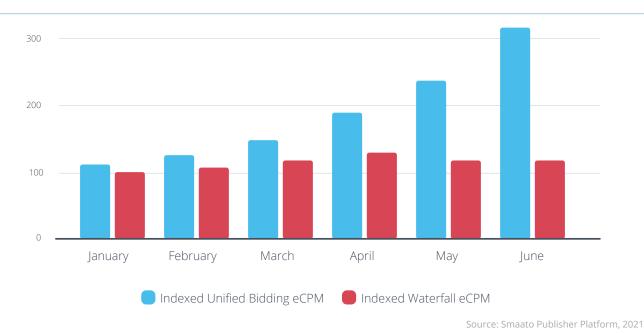
Note: Revenue calculated using equal ad request volumes for more accurate comparison. Figures are for publishers on the platform who monetize with both Unified Bidding and Smaato Exchange.

Marketers gain better transparency, and publishers get to see that confidence reflected in higher eCPMs and better fill rates.



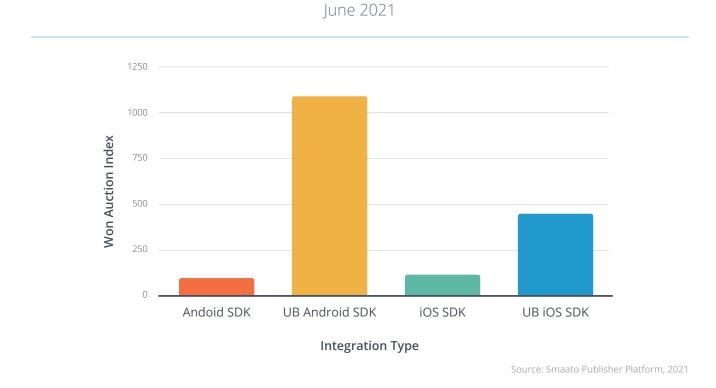
Indexed eCPM for Unified Bidding vs. Exchange for one Publisher on the Smaato Platform

H1 2021



With Unified Bidding, this same publisher's fill rate was 14x greater than the waterfall exchange fill rate. **That's a 1,371% increase**.

For June of 2021, for example, across both iOS and Android, Unified Bidding resulted in significantly higher win rates globally.



Select Publishers' Won Auctions, Unified Bidding vs. SDK (Indexed Values)

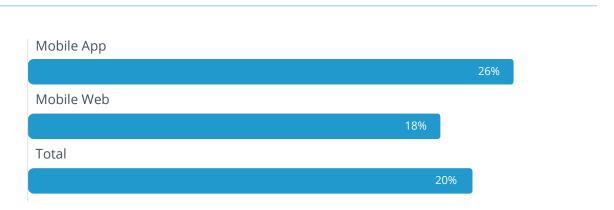
Publishers who adopt Smaato's Unified Bidding experience a boost to revenue, an increase in fill, and generally higher eCPMs than the traditional waterfall bidding approach, driving top-line revenue and performance.

Prebid Mobile Adapter

Prebid, a trusted header-bidding open-source solution, has an option for mobile, too. Prebid SDK offers publishers an opportunity to connect with many demand sources using light-weight adapters, rather than juggling multiple SDKs. This helps reduce latency while centralizing demand.

Smaato's Prebid Mobile Adapter lets publishers integrate with Smaato's robust demand through any Prebid-hosted server. The results speak for themselves. In fact, one publisher saw a **21% increase in revenue in less than a month, and a 17% increase in eCPMs from Smaato alone**.

Select Publishers' Won Auctions, Unified Bidding vs. SDK (Indexed Values)



% Changes vs. Previous Year

Source: Smaato Publisher Platform, 2021



June 2021



Privacy, Increased User Controls, and Transparency

The Crumbling Cookie & Evolving Privacy Laws

The question now is not, "will the cookie crumble," but rather, "how quickly will the cookie become obsolete?"

With Chrome as an exception, almost every browser is already limiting third party cookies, including Apple's Safari and Mozilla's Firefox, which actually block third party cookies by default.

In a recent poll by Integral Ad Science, nearly half (49%) of US digital media professionals cited third-party cookie depreciation as one of their top three challenges.²⁶

While the demand is high for cookie removal, the logistics are proving to be a bit more complicated for some. Google Chrome recently confirmed a new third-party cookie removal deadline for late 2023 (a delay from their earlier estimate of 2022). This gives developers more time to test out targeting replacement technologies in sandbox environments.

²⁶ eMarketer, March 2021



Some may use this news to delay necessary changes and preparations for a cookiefree world. Regardless of Chrome's timing delays, the trend away from cookie tracking continues to gain momentum.

As users demand more privacy and transparency, and while countries pass restrictions to protect them, evolution to a cookie-free world is inevitable. Those who prepare early will be better equipped to handle the changes when they do come.

Effects of Coming Changes to Third Party Cookies/Identifiers to Their Company's Use of Data

US, January 2021 | n=121

Increase spending on use of first-party data	
	420/
	42%
Bring data managment in-house	
36%	
Centralize all cutomer relationship management (CRM) data into one repository	
35%	
Increase use of AI for consumer insights	
31%	
Increase focus on developing in-house identity resolution solutions	
29%	
Increase efforts to build second-party data relationships	
27%	
Increase spending/emphasis on contextual advertising	
24%	
% of Respondents	
Source' IAB "IAB	State of

From the General Data Protection Regulation (GDPR) to California Consumer Privacy Act (CCPA) to Canada's new Consumer Privacy Protection Act (CPPA), data privacy legislation is gaining traction worldwide. These laws are designed to help put users in control of their data, and to improve transparency, so users know how their data might be used. It is critical to ensure compliance with these laws and to respect user privacy.

Smaato is dedicated to protecting user privacy. We work closely with IAB and IAB Europe to ensure compliance with ever-evolving legislation, while designing solutions for publishers and marketers that deliver results without compromising user privacy.²⁷

While there are challenges, there are also incredible opportunities to craft more personalized, tailored experiences for users based on context and first party data.

²⁷ IAB, "IAB State of Data 2021", March, 2021



iOS 14.5

Apple's Safari led the charge on removing third party cookies. Their in-app experience is now also reflecting increased privacy controls for users.

For years, Apple's Identifier for Advertisers (IDFA) created a unique ID tag for each to help advertisers track and measure app install campaigns.

While systems were in place to help protect user privacy, the options were both limited and passive. Apple eventually introduced Limit Ad Tracking (LAT). Buried in the settings menu, users could indicate a desire to opt out of app tracking.

AppTrackingTransparency (ATT) is a new framework within iOS 14, and affects how devices share data. Instead of devices having IDFA-sharing set as the default, iOS requires explicit permission for tracking users and accessing IDFA.

In short, ATT requires users to opt in to app tracking. For users who opt in to app tracking, IDFAs are still created and shared. While there was no way to know for sure how many would opt in, initial projections put this around 20%.

Recent data from the US suggests that the opt out rate is substantially higher – that only 6% are opting in to app tracking, with 94% choosing not to opt in.

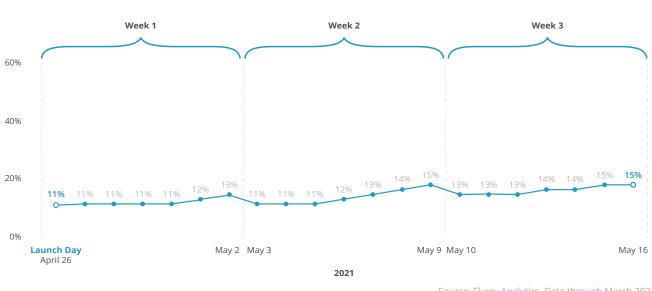


Daily Opt-In Rate After iOS 14.5 Launch Across All Apps Worldwide, 2021 % of Active Mobile App Users Who Allow App Tracking

Source: Flurry Analytics, Data through March 2021

Note: this may not be the whole story. The data shown does not reflect a breakdown of opt in by app. It is possible that users may be opting out of specific apps based on distrust of the brand or past experience, while opting into others they may trust more.

Worldwide data suggests opt-in rates that are more consistent with initial projections, but are still low.



Daily Opt-In Rate After iOS 14.5 Launch Across All Apps US, 2021

% of Active Mobile App Users Who Allow App Tracking

Source: Flurry Analytics, Data through March 2021

Given these lower opt in rates, how do marketers measure success?

SKAdNetwork Attribution

SKAdNetwork is a framework developed by Apple to measure the conversion rates of app installs. This framework uncouples the impression event from the actual app installation, removing the need for user identifiers. SKAdNetwork operates through an end-to-end attribution flow that is controlled by the App Store and validates each attribution with a cryptographic signature assigned to the ad when provided by the advertiser.

More simply, SKAdNetwork ensures accurate conversion rates, verified by Apple, without compromising device identity or user privacy.

This offers a compliant alternative to IDFA and an accurate way to measure campaign success.

Smaato's NextGen SDK is fully SKAdNetwork, ATT, and IDFV enabled. As new SKAdNetwork versions are released, our NextGen SDK is built to keep up.

Publishers

Smaato's NextGen SDK 21.6.6 is the minimum version needed for SKAdNetwork functionality only.

Want to get the most out of iOS 14.5?

To enjoy additional functionality, including ATT and IDFV, publishers should make sure that they have updated to at least version 21.6.12, as this includes the support for passing ATT and IDFV (the identifier for vendors), though for maximum features, please be sure to download the newest version.

Marketers

When IFA is not available, there is still an opportunity to look at the extension of the device object, including IDFV and ATT (referred to as ifv and atts in the bid request). We include information for how to look for changes in bid request device objects in our developer documentation, which you can check out **here.**

Android 12

As iOS 14.5 dominated headlines for months, Google's Android 12 changes are starting to play catch up.

While prior software updates have given Android users the ability to opt out of personalized ads, device IDs are still in use. In addition to offering more transparency into app behavior and access for things like microphone or location data, Android 12 will give users an option to wipe their device ID.

Just like Apple's earlier LAT update, Google's Android will let users go into settings and ask to replace unique device identifiers (the Android Advertising ID) with a string of zeros.

Of course, the main difference is that Apple's iOS 14.5 update makes opt-out the default, while Google's approach is more passive user protection.

It's likely, though, that the privacy updates from Android will continue to mimic iOS's changes, which will force app install attribution changes here, as well.

General Campaign Attribution

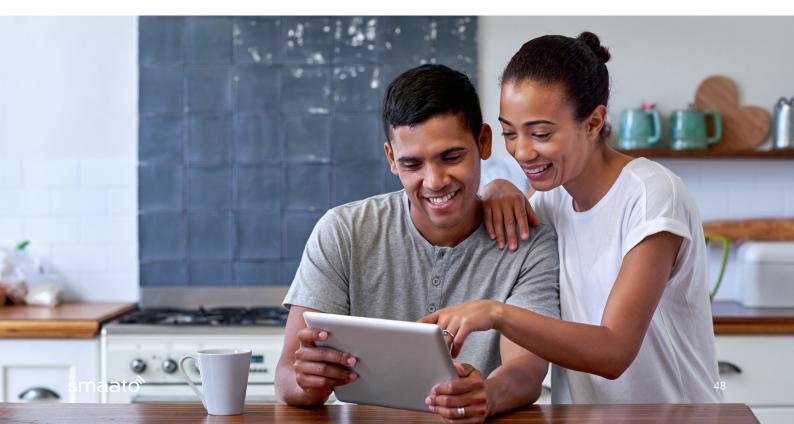
Of course, advertisers and marketers want to ensure accurate campaign attribution. Campaign tracking must be done in a privacy-aware and compliant way. At Smaato, one example of this is our deep linking support. Valuable information is passed in the URLs themselves: with deep linking, if a user doesn't have the app installed, a fallback URL is triggered. Because it is possible to see which link was activated (the link to the content directly, or the fallback URL to trigger an app download), we can help marketers see app install attribution.

Some advertisers rely on a third party Mobile Measurement Partner (MMP) to help determine user attribution and campaign performance. While MMPs can share whether an app was installed or a particular event occurred, they have some major limitations. Most notably, MMPs can't tell you about the context.

The Smaato platform is evolving to help marketers and DSPs better understand their attribution, not only with understanding install data, but by sharing aggregated (and thus privacy compliant) audience insights, so marketers can better optimize future campaigns. As an omnichannel platform, we will soon also be able to share insights into which channels drove campaign success, whether web, in-app, or CTV and beyond.

At Smaato, we can also help publishers measure the success of their direct and house ad campaigns. As we are an omnichannel solution, we get unique visibility into crosschannel and cross-device campaign performance.

Impression beacons can also help provide user-privacy compliant metrics by sharing information about whether an ad was clicked and whether or not an action was taken, without revealing any personal data or identifiers.



First Party Data Power

With all this in mind, how will marketers actually reach the right people?

The secret lies in decoupling the user themselves from their behavior and actions. Context plays a huge part here. For example, if someone is streaming an action movie, certain assumptions can be made without tracking the user at all. Vital information appears in the ad request, like device type (in this action movie example, let's say it's an Xbox). A user streaming video content on an Xbox is likely a gamer. These two clues help to build audience segmentation data. Marketers can then deliver content that would appeal to someone who is both a gamer and action movie aficionado. In this way, marketers can reach audiences based on where they are – and not who they are.

Of course, matching content with context is not a new concept. Do more truck and beer commercials tend to run during sporting events?

Our OTT solution is built with in-house server-side ad insertion. Pre-stitching ads into existing content gives publishers and marketers a chance to align on context. Personalized creative is delivered without actually targeting a specific person. How? By reaching viewers based on what they're watching versus who they are.

Leveraging first party data is the key, here. Publishers can deliver personalized experiences without compromising any personal data, while marketers can target audience groups rather than singling out an individual.

88% of marketers say collecting first-party data is a 2021 priority.²⁸

Publishers are already collecting this data with user consent. (Unlike third party data, often bought and sold without user permission, first party data comes with direct or implied consent from existing users.)

"Because of this willful relationship and implied or active consent, first-party data is more accurate, provides better insights, has higher conversion rates and is a priority for maintaining customer relationships. That means that first-party data is now becoming the king of digital advertising." ²¹

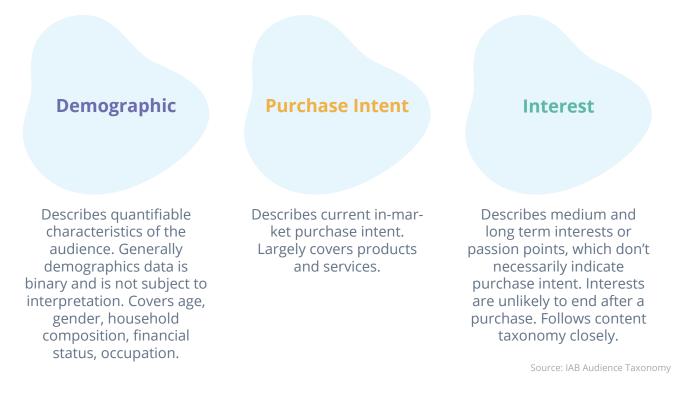
> Gary Walter, President and CEO Infutor Data

²⁸ Marketing Dive, January 2021 | ²⁹ Forbes, January 2021

At Smaato, we want to help publishers leverage this powerful data to help create customized user experiences and help marketers get in front of the right audiences.

Smaato is creating a transparent and free-to-use data-driven audience marketplace right inside our Digital Advertising Technology Platform.

There are three different categories of first party data that publishers are able to gather: **demographic information**, **purchase intent**, and **interest**.



This data offers vital insight into audiences, and can help marketers deliver informed and relevant campaigns. Instead of purchasing third party data or targeting users, marketers can rely on this compliant, first-party data to get in front of an engaged and relevant audience.

Audience Targeting

You may have heard about FLoC. Federated Learning of Cohorts (FLoC for short) is a type of web tracking through federated learning (consistent programmatic learning of user behavior) which is done in a privacy centric way. Instead of cookies which leave crumbs wherever you go, FLoC groups people into cohorts based on their browsing history.

FLoC is a Google-proposed solution. Google is omnipotent when it comes to browser tracking, giving them a big edge when it comes to grouping individuals by similar browsing history. Of course, this raises some red flags, and has received a bit of push back in the industry; adoption is low.

What solutions like this one are doing, more basically, is analyzing user behavior, and then aggregating this information into audience segments or cohorts. Rather than sharing individual user data, these giants are able to provide group data about different types of users/audiences.

This particular solution uses Google's data power, but this creates a dependent relationship on Big Tech for publishers. While they may get the segmentation information they need, they are forced into an unbalanced relationship which lacks transparency.

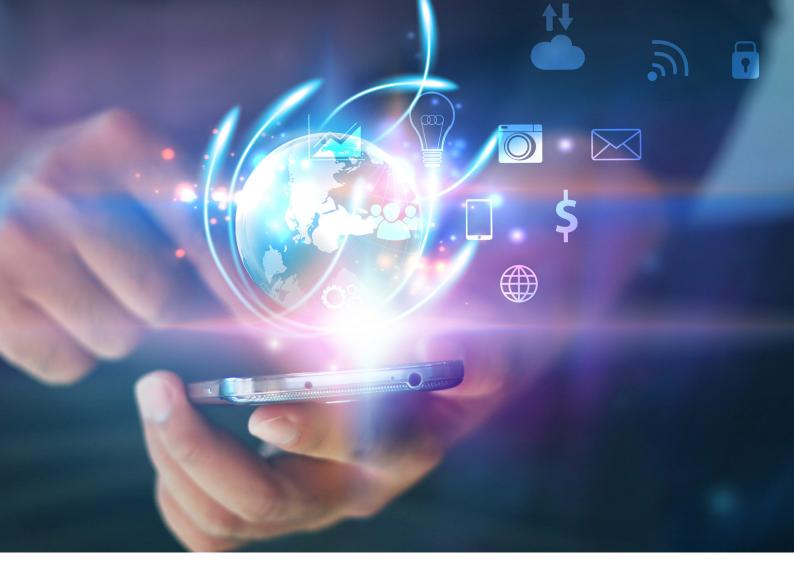
We want our publishers to be able to create their own walled gardens, without a reliance on Big Tech. By enabling audience segmentation for our publishers, we will give them the power to control their own cohorts. What does that look like?

We're making it easy for publishers to bring, control, and manage their first-party data all in one place. As part of our platform, publishers can fully manage their first party data, protecting user privacy and improving user experience.

With Smaato, publishers will be able to plug in their first party data so that it conveniently lives within the platform. Then, they'll be able to sort attach segments and cohort data to users, which can be used for efficient targeting in anonymous ad auctions without compromising user privacy. This puts publishers in control of their first party data, while giving marketers valuable insights to make campaign targeting more efficient and effective.

Evolving privacy laws (and first party data management) also tie into a shifting landscape. Take, for example, the shift from open exchange to private marketplace deals. Private marketplaces give publishers a chance to hand-select which marketers participate in an auction. This provides a phenomenal opportunity for brand alignment. Marketers are willing to pay more for access to these brand-relevant and contextual placements, while publishers get control over who has access to their inventory. As private marketplaces gain traction, we expect that publisher-managed first party data will play an integral role in a cookieless world.

Similarly, just as private marketplaces help inform which marketers can participate in an auction, bundled audience data can help marketers choose which inventory to bid on, based on which cohorts are most relevant for their campaigns.



Ad Fraud Protection and Prevention

Support from our Partner:



Staying proactive about cybersecurity is a must. Publishers can be held legally liable for bad ads on their sites, while quick fixes such as ad blockers tend to weed out legitimate, revenue-producing ads. An added challenge is the fact that "malvertising" is constantly evolving and bad actors have become increasingly sophisticated.

This is why Smaato has partnered with GeoEdge, working in collaboration to stop bad ads from reaching your audiences and impacting your brand.

There are many schemes that fraudsters use to try to take advantage of publishers, makreters, and users alike. Geoedge identified a selection of new trends in ad fraud methods:

Device Fingerprinting

Companies use **device fingerprinting** to tailor content based on parameters such as the user's device, browser, language preference, and IP address. Malvertisers make use of the same tactics for ill intent, utilizing device fingerprinting to target relevant victims. This enables them to use specific criteria to customize their attack.

Cloaking

With **cloaking**, the content the user sees on their browser differs from the information presented to search engines. This method is often used to boost a website's ranking. Both user and search engine can be deceived when a malvertiser becomes the middleman. These fraudsters are then able to launch an undetected attack to obtain sensitive user information.

Cookie Syncing

Cookie syncing involves mapping a user ID across multiple systems such as ad networks, exchanges, DSPs, and data providers, allowing them to tailor advertising to their users. Cookie syncing has been abused by malvertisers to glean invasive data, and because cookie syncing doesn't use a publisher's ad server, it is particularly difficult to detect and to thwart. We hope that as the cookie continues to disappear, this threat will be neutralized organically.

Through a combination of the latest technology and Smaato's in-house Ad Quality team, we protect your users by delivering safe ads from reputable sources. At Smaato, we offer safe monetization so that you can focus on what matters — building a great user experience without worrying about exposing your users to disruptive, inappropriate ads.

Clickbait

Malvertisers employ psychological redirects to send users to scam sites, using deceptive or offensive clickbait. The user unknowingly triggers the malicious response by clicking on an ad that sends them directly to a scam site.

Deceptive Videos

In addition to displaying clickbait ads, malvertisers are now starting to present deceptive video ads. For example, attackers may buy a banner and then serve a deceptive video in the banner. The video will then present a product – let's say diet pills – without any vendor/company/certificate behind it.

After clicking on the video, the user will be delivered to a page armed with a server-side cloaker (a legitimate page that was built to hide the deceptive content). As before, when a targeted user clicks, they would be redirected to a deceptive page which promotes a product or service without any legitimate company or vendor behind it.

To create a safe environment for both publishers and marketers, Smaato deploys the latest technology to fight against fraud and protect brand safety. For advertisers, Smaato is vigilant in providing safe, high-quality traffic. Our multi-level check, which includes a customer identification program and stringent traffic reviews, provides advertisers with only the best traffic.

The prevalence and creativity of bad actors can compromise the AdTech space. But Smaato works closely with GeoEdge to keep the AdTech space safe. Smaato is dedicated to protecting publishers and users from negative experiences such as inappropriate or offensive content, and from scams that seek to hijack browsers for ill intent. With GeoEdge, **problematic ads are detected and blocked in real time**. Together, we can help you maintain your digital reputation for maximized revenue and an improved user experience.



Thank You

From shifts in the digital ad spend to innovative new ad formats, to changes in targeting, 2020/2021 has brought forth many changes, paving the way for opportunities ahead.

Whether you are a publisher seeking to monetize your OTT inventory, a marketer eager to leverage powerful first-party data to better optimize your campaigns, or a developer who wants to deliver outstanding user experiences, we're here to help.

Check out additional resources, white papers, and brochures <u>on our website</u>, or give us a call to learn how the Smaato platform can help transform your omnichannel strategy.



Smaato's digital ad tech platform is a completely omnichannel, self-serve monetization solution and ad server. Our controls make monetization simple. Publishers can bring their first-party data and manage all inventory in one place. Marketers get access to the highest-quality inventory so they can reach audiences around the world and on any device. Smaato is headquartered in San Francisco, with additional offices in Hamburg, New York City, Beijing, and Singapore.

www.smaato.com