



PubMatic

Q3 | **QUARTERLY**
2018 | **MOBILE INDEX**

PubMatic's Quarterly Mobile Index (QMI) report was created to provide both publishers and advertisers with key insights into the mobile advertising industry.

ABOUT PUBMATIC'S QUARTERLY MOBILE INDEX

By analyzing over 12 trillion advertiser bids flowing each month through PubMatic's platform, we can observe real-time developments in the mobile space that may allude to broader digital industry trends. We can then compare this information to other published data to further understand changes in the mobile landscape. We are committed to providing best-in-class mobile tools and services, and we believe that information sharing is crucial in aligning the digital industry towards best practices and, ultimately, growth in mobile advertising.

Note that directional data might not be comparable with prior reports.

IN Q3 2018, THE FOLLOWING KEY TRENDS EMERGED

KEY TREND

01

Driven by app growth, mobile video reaches a key milestone

KEY TREND

02

Mobile header bidding rises as use extends to apps

KEY TREND

03

Back-to-school season boosts mobile ad volume in retail vertical



WHAT DOES THIS MEAN FOR PUBLISHERS AND ADVERTISERS?

1

Advertiser interest is driving global mobile video ad spend growth, creating incremental revenue opportunities for publishers.

Following consumers, who spend the majority of time watching digital video on mobile devices, advertisers worldwide are expected to spend \$20 billion on mobile video advertising in 2018.¹ Ad buyers feel optimistic about mobile video with most planning to ramp up investments in the format over a 12 month period.² For publishers hoping to take advantage of this growing opportunity, it is important to focus on high-value content and robust quality controls that will attract brand advertisers.

¹“Cowen’s Inaugural Midyear Ad Buyer Survey – Ahead of The Curve Follow Up Series,” Cowen and Company, July 2018

²“Video Landscape Report,” Interactive Advertising Bureau, May 2018

2

After becoming mainstream on the web, header bidding is now making strides into app environments.

Header bidding has reached widespread adoption globally for mobile web impressions. The next growth spurt will likely happen away from the header. The principles of the tactic are being adapted into what the industry calls 'in-app header bidding,' creating sizeable new monetization opportunities. In-app header bidding technology development will likely continue into and throughout 2019, incorporating the benefits of server-to-server functionality to minimize the current SDK drawbacks. Publishers who keep up with the evolution of in-app header bidding will stand to tap into a fast growing revenue stream over the next 18 months.

3

Evolving consumer behavior is extending advertising for the back-to-school shopping season, increasingly leveraging mobile as well.

Almost one-third of US parents were out in force shopping for the return to school by mid-July.³ With the second-largest shopping season of the year in near-full swing prematurely, early-season ad campaigns appeared to follow suit. Most back-to-school advertising activity occurred in August, however, coinciding with the bulk of consumer spending.⁴ Ad buyers must take these fast shifting consumer behavior patterns into account to ensure digital campaigns deliver relevant, timely information (and deals) to a generation of shoppers demanding palpable value from advertisements.

^{3, 4} "2018 Back-to-School Survey – Sizing Up the Season," Deloitte, June 2018

KEY TREND

01

DRIVEN BY APP GROWTH, MOBILE VIDEO REACHES A KEY MILESTONE

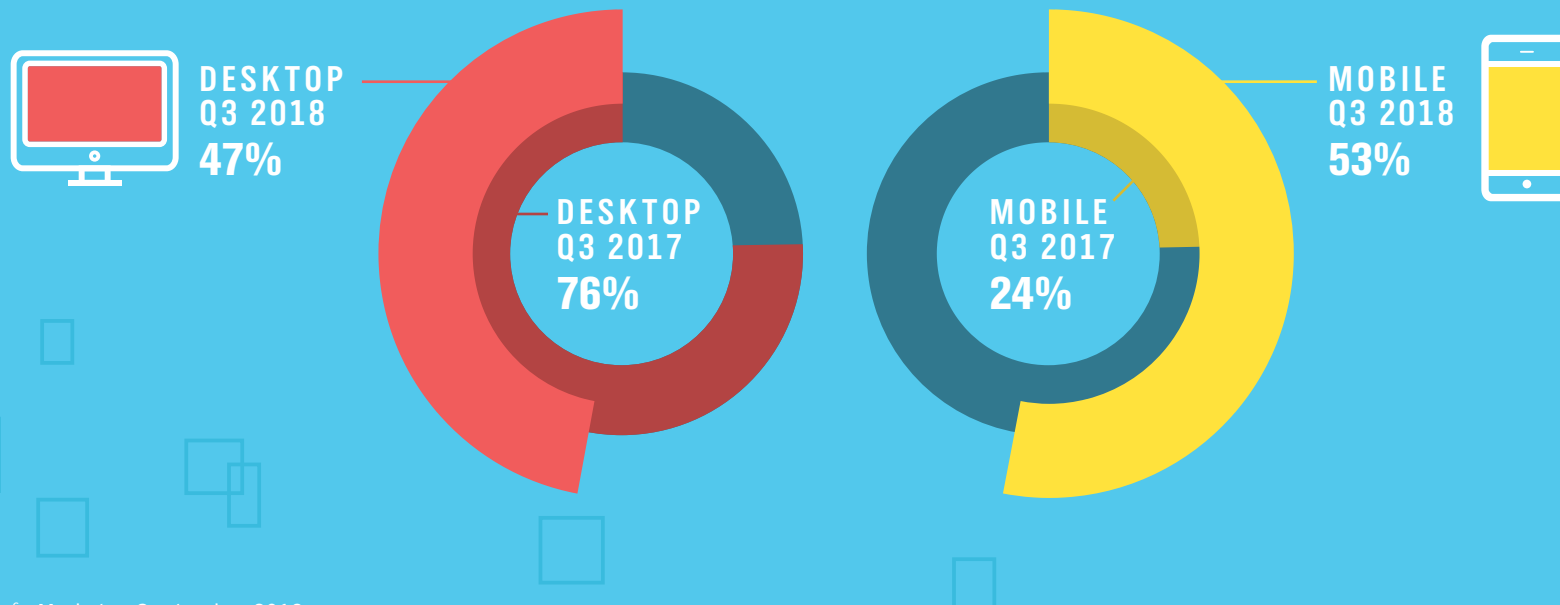
Mobile video is the fastest-growing video type and already takes the greatest share of time consumers spend watching digital video. Mobile video has also become the primary driver of digital video ad revenue. Moreover, ad buyers feel optimistic about increasing their investment on the format.⁵

⁵ "Video Landscape Report," Interactive Advertising Bureau, May 2018



OVER HALF OF VIDEO IMPRESSIONS MONETIZED VIA MOBILE DEVICES

Mobile share of video volume more than doubled year-over-year in Q3 2018, representing the majority (53%) of video impressions monetized through PubMatic for the first time. The milestone is aligned with a market shift toward mobile environments where consumers spend nearly half of their time with digital video per day.⁶

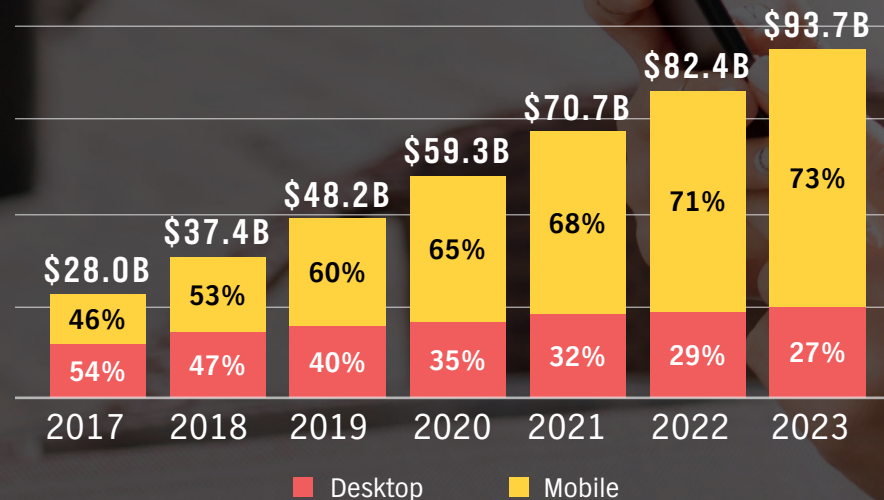


⁶ eMarketer, September 2018

BROADER VIDEO MARKET ALSO SHIFTING TOWARD MOBILE DEVICES

Mobile video ad spending is forecasted to grow 54% YOY to represent just over half of digital video ad spending worldwide in 2018. By comparison, desktop video ad spending will rise 16% YOY to take a 47% market share this year.⁷ The shift toward mobile follows consumer trends so far and might get ahead in the coming years as the highly engaging format remains coveted among advertisers. eMarketer estimates that mobile devices will take a 44% share of daily time spent watching digital video among US adults in 2018.⁸

DIGITAL VIDEO AD SPEND WORLDWIDE⁷



SHARE OF TIME SPENT PER DAY WITH DIGITAL VIDEO BY US ADULTS, BY DEVICE, 2018⁸



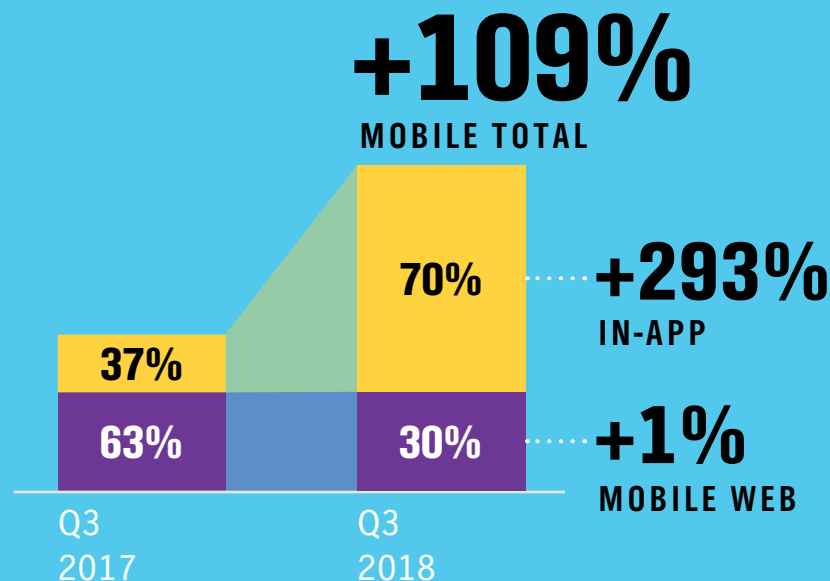
⁷ "Cowen's Inaugural Midyear Ad Buyer Survey – Ahead of The Curve Follow Up Series," Cowen and Company, July 2018

⁸ eMarketer, September 2018

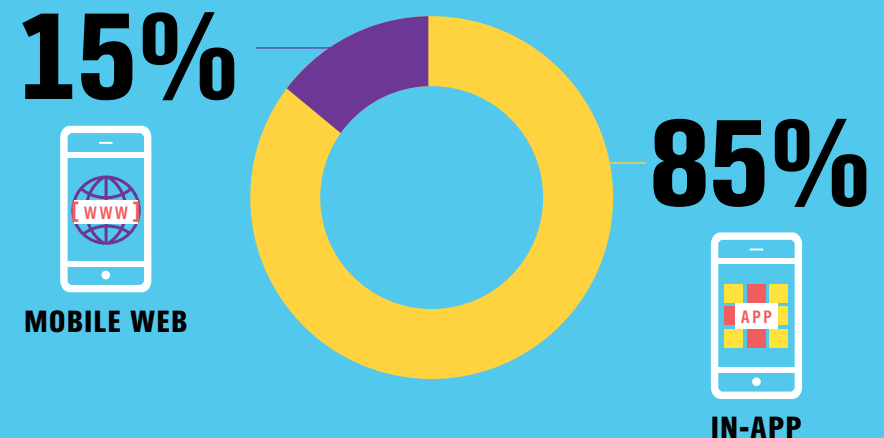
MOBILE VIDEO VOLUME GROWTH DRIVEN BY APPS

Total mobile video impression volume monetized through the PubMatic platform more than doubled YOY (+109%) in Q3, driven primarily by apps. In-app video volume almost quadrupled YOY to reach a 70% share of mobile video impressions in Q3 2018. Although robust, the shift toward in-app video advertising still lags consumer behavior, as 85% of time spent by US adults watching mobile video is expected to happen via apps this year.⁹ This highlights the rising opportunities for advertisers and in-app publishers to capitalize on in-app video.

MONETIZED MOBILE VIDEO IMPRESSION VOLUME,
BY PLATFORM, YOY CHANGE



SHARE OF TIME SPENT PER DAY WITH MOBILE VIDEO
BY US ADULTS, BY PLATFORM, 2018⁹



⁹ eMarketer, September 2018

POSITIVE AD BUYER SENTIMENT TOWARD MOBILE VIDEO

Mobile video advertising growth forecasts are informed by a bullish outlook among marketers. According to research by the Interactive Advertising Bureau published in May 2018, 51% of ad buyers expected to increase their mobile video ad spend “in the next 12 months.”¹⁰ Considering that ad spending typically peaks during the holiday shopping season, further gains may be possible for mobile video advertising before the year is out.

MOBILE VIDEO AD SPEND INTENT IN THE NEXT 12 MONTHS AMONG US AD BUYERS, MAY 2018¹⁰



INCREASE
AD SPEND

51%



MAINTAIN
AD SPEND

46%



DECREASE
AD SPEND

3%

¹⁰ “Video Landscape Report,” Interactive Advertising Bureau, May 2018



KEY TREND

02

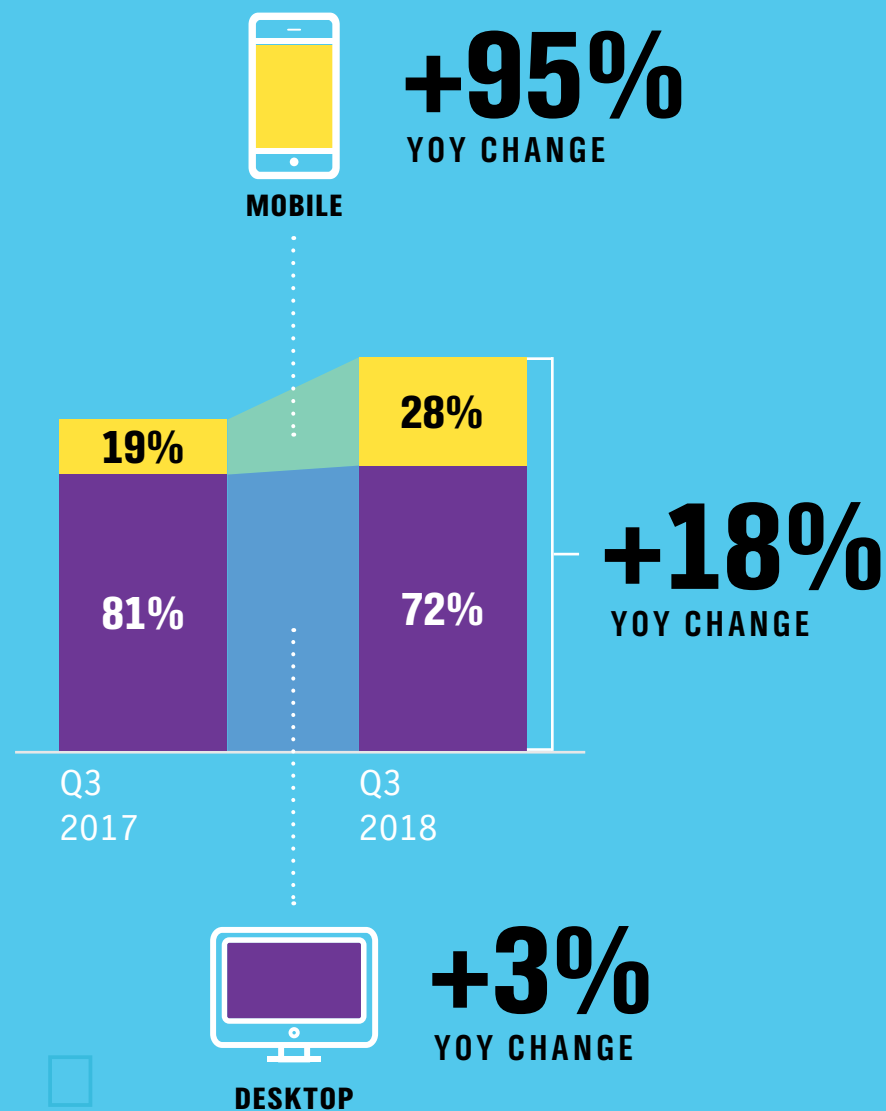
MOBILE HEADER BIDDING RISES AS USE EXTENDS TO APPS

Header bidding is broadly viewed as a mature browser technology, both on desktop and mobile devices. Further web-based growth is likely as more buyers get used to first-priced auctions.¹¹ As header bidding takes hold on app environments, incremental monetization opportunities will become available to publishers who get in-app header bidding right.

¹¹ "Header Bidding Update 2018 - What's the Outlook for Web, Mobile App and Video?"
Lauren Fisher, eMarketer, October 2018

HEADER BIDDING CONTINUES TO EXPAND INTO MOBILE

Mobile volume monetized through PubMatic's header bidding technology nearly doubled between Q3 2017 and Q3 2018, while desktop rose 3% YOY. Although desktop still takes the lion's share of header bidding volume, mobile represented over one-quarter of the total in Q3 2018 as use of the tactic expanded into apps.



STRONG MOBILE HEADER BIDDING GROWTH WORLDWIDE, LED BY APAC

Monetized mobile header bidding volume enabled by PubMatic technology, including web and app environments, expanded across all regions. APAC was the fastest growing with a 135% YOY improvement in Q3 2018. Growth for the mobile tactic in EMEA may have slowed, at least partially, as a result of advertisers moving budgets toward private marketplaces following the launch of GDPR earlier this year.¹²

MONETIZED MOBILE HEADER BIDDING VOLUME YOY CHANGE, BY REGION, Q3 2018

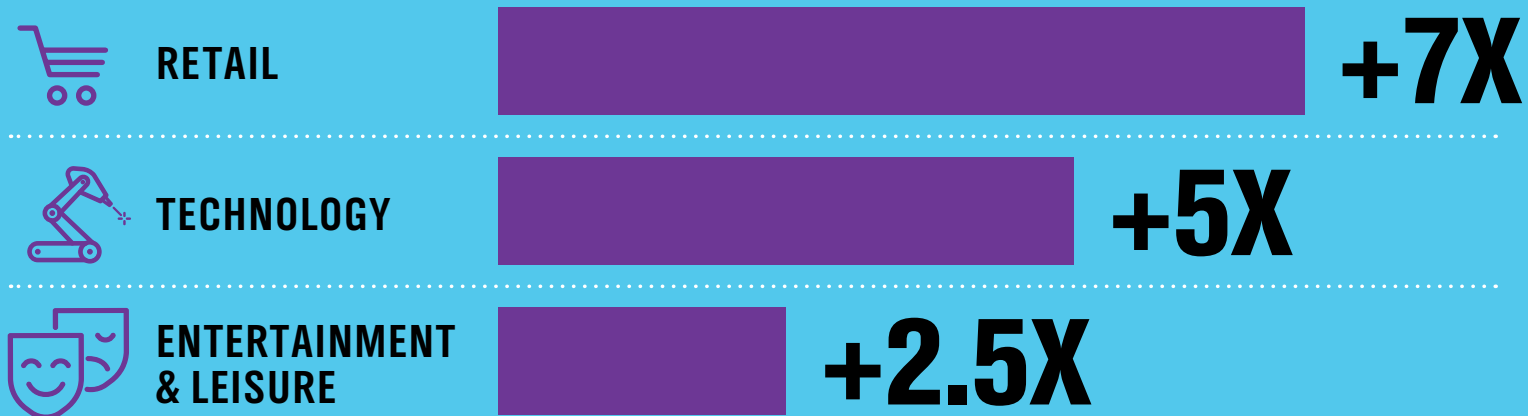


¹² "How GDPR is Moving Ad Budgets Toward Private Marketplaces," Ross Bennes, eMarketer, August 2018

RETAIL INDUSTRY LEADS MOBILE HEADER BIDDING EXPANSION

Retail publishers saw the sharpest increase in mobile header bidding volume through our platform, likely supporting monetization efforts in the largest vertical for digital ad spending in the US. The sector's investment in digital advertising will reach \$23.5 billion this year,¹³ with nearly 70% going to mobile.¹⁴

MONETIZED MOBILE HEADER BIDDING VOLUME YOY CHANGE, TOP 3 VERTICALS, Q3 2018



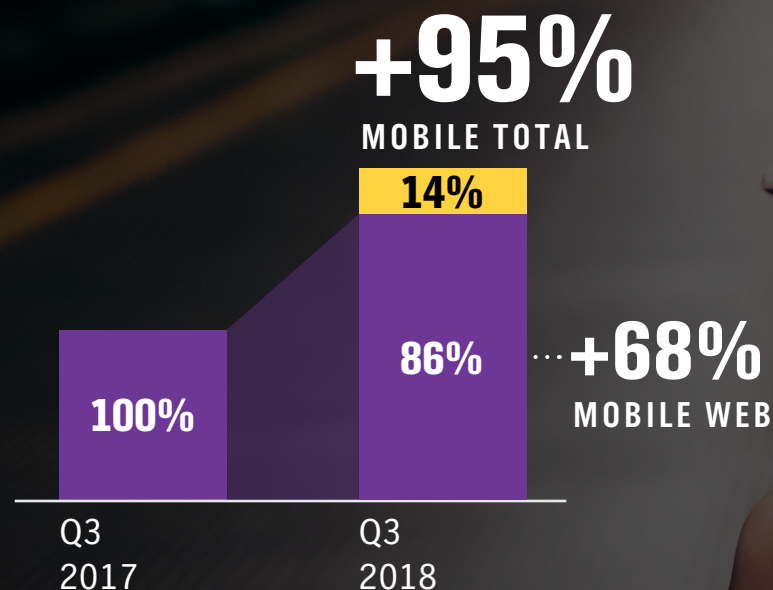
¹³ "Retail Dominates Digital Ad Spending in the US," eMarketer, June 2018

¹⁴ "US Retail Industry StatPack 2018 - Digital Ad Spending Forecast and Trends," Corey McNair, eMarketer, June 2018

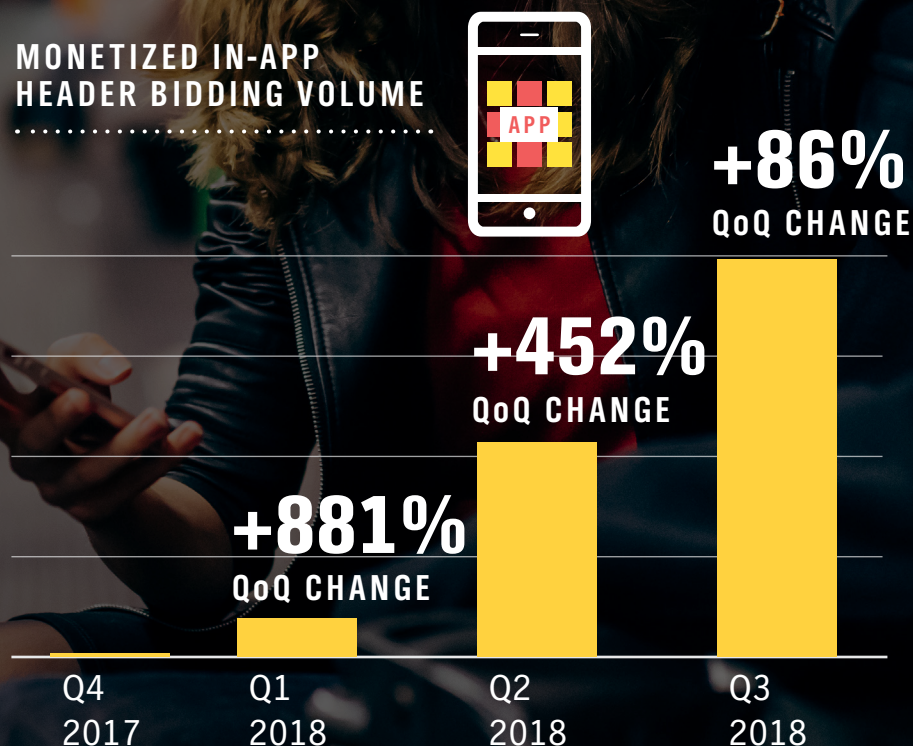
IN-APP HEADER BIDDING GAINS TRACTION

Implementation of in-app header bidding is in the early days, but adoption has risen sharply throughout 2018, with apps reaching a 14% share of monetized mobile header bidding impressions in Q3. Although a year-over-year comparison of in-app volume enabled by PubMatic is not yet available—adoption only started in earnest in Q1 2018—quarterly growth has reached up to triple-digit rates.

MONETIZED MOBILE HEADER BIDDING VOLUME YOY CHANGE, MOBILE WEB VS. IN-APP



MONETIZED IN-APP HEADER BIDDING VOLUME



HURDLES REMAIN AHEAD FOR IN-APP HEADER BIDDING GROWTH

Improved understanding of a new technology is often the first hurdle to overcome before it can be widely adopted. Unsurprisingly at this early stage, the most cited response as to why publishers have not yet adopted in-app header bidding was a limited understanding of the technology (31% of respondents). Publishers also cited technical concerns such as implementation issues (23%) and latency (11%) as well as concerns about scalability.¹⁵

WHAT IS THE MAIN FACTOR THAT PREVENTS APP PUBLISHERS IN NORTH AMERICA FROM USING IN-APP HEADER BIDDING?¹⁵

% of Respondents, July 2018

Limited understanding of technology

31%

Implementation issue

23%

Few programmatic deals/mostly direct deals

14%

Difficulty scaling PMP deals

11%

Latency

11%

Compatibility issues

10%

¹⁵ "Header Bidding Research Report 2018: The Current State of Mediation and In-App Header Bidding," InMobi, September 2018

Note: among respondents not currently using in-app header bidding

A man and a woman are looking at a smartphone together. The man, on the right, is wearing glasses and a blue button-down shirt. The woman, on the left, has blonde hair and is smiling. They are both looking down at the phone held by the man.

SOFTWARE DEVELOPMENT KITS AND SERVER-TO-SERVER SOLUTIONS

Most industry experts see header bidding accounting for a greater share of app inventory in the future, but software development kits (SDK) integrations and server-to-server (S2S) setups need further improvement.¹⁶ Traditionally, for a mobile app publisher to work with a demand partner, the demand partner's SDK had to be implemented in the app with some of them exhibiting significant drawbacks. S2S promises to address these shortcomings, laying the ground for further in-app header bidding growth.

¹⁶ "Header Bidding Update 2018 – What's the Outlook for Web, Mobile App and Video?" Lauren Fisher, eMarketer, October 2018

SDK DRAWBACKS

1. Increase download size, which deters users from installing the app
2. May introduce stability risks
3. May result in poor user experience when SDK contains bugs
4. Limits options to add new demand sources to installed base
5. Incorporating additional SDKs consumes development resources without assurances of the new source's performance

S2S TO THE RESCUE

1. Demand sources can be added or removed across an app's entire installed base without the need to redeploy the app
2. Reduces the app's download size as it requires only a primary partner's SDK on the app while all other demand is accessed on the server-side
3. Mediation of demand partners is moved to the cloud
4. Offers significantly higher revenue potential

“When choosing a mobile in-app S2S solution, monetization teams should consider how easy it is to add and remove partners, as well as the level of analytics provided by the solution.”

—Mike Chowla, Director of Product Management, Header Bidding at PubMatic and Prebid.org board member

KEY TREND

03

BACK-TO-SCHOOL SEASON BOOSTS MOBILE AD VOLUME IN RETAIL VERTICAL

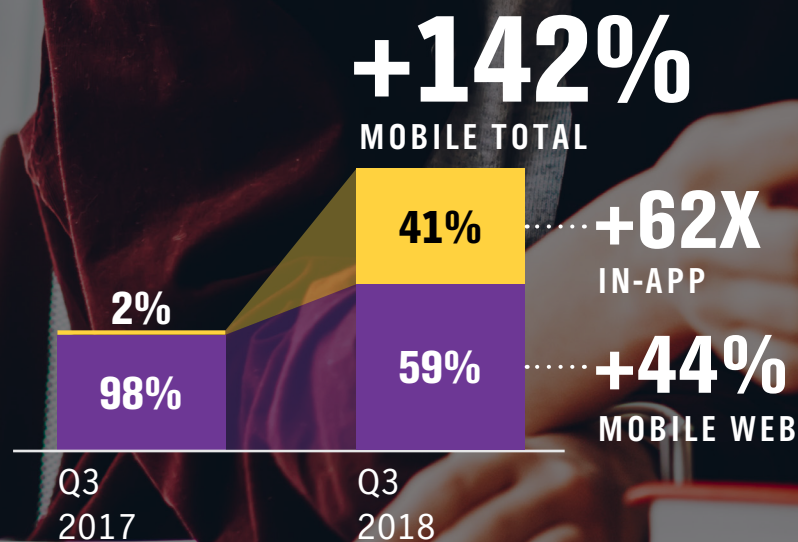
The second-largest shopping season of the year encouraged early seasonal campaigns as one-in-ten US parents kickstarted their back-to-school shopping as early as June. Most back-to-school advertising still took place in August, however, coinciding with the month when a majority of back-to-school spending occurs.



BACK-TO-SCHOOL SEASON DROVE TRIPLE-DIGIT GROWTH IN RETAIL MOBILE AD VOLUME

Retail publishers saw a 142% YOY increase in monetized mobile impression volume worldwide in Q3 2018. While in-app volume was negligible at the same point in 2017, retail publisher impressions monetized through apps increased exponentially to take a 41% share of mobile volume enabled by PubMatic this year. Retailers may have leveraged mobile advertising more aggressively this year following 2017 reports of strong back-to-school shopping activity via handheld devices, including YOY increases of 44% and 64%, respectively, in mobile orders and revenues, not to mention the average increase in mobile order value was 2.5X that of desktop.¹⁷

MONETIZED MOBILE IMPRESSION VOLUME IN RETAIL VERTICAL, BY PLATFORM, YOY CHANGE



US BACK-TO-SCHOOL RETAIL ECOMMERCE METRIC GROWTH, BY DEVICE¹⁷

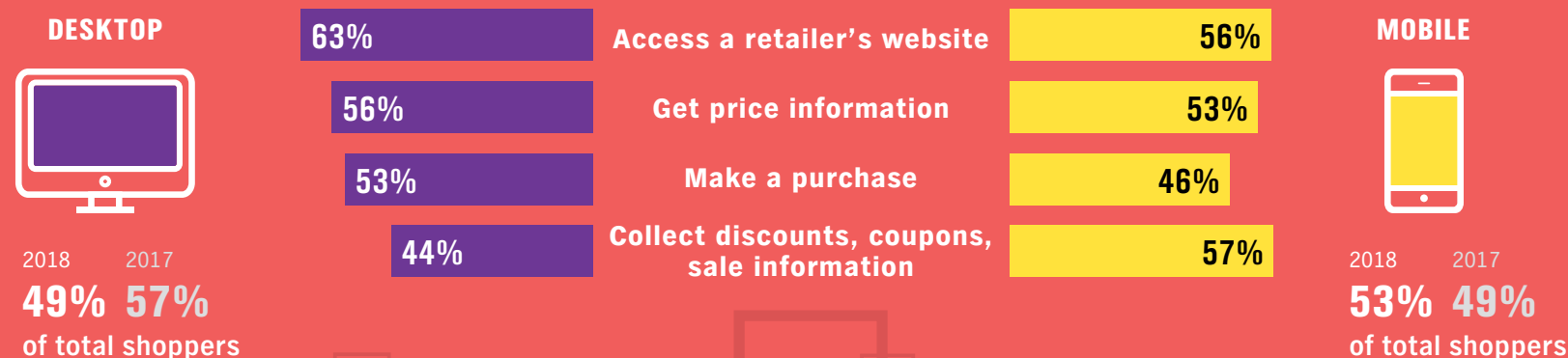
	MOBILE	DESKTOP
Orders (% change)	44%	-2%
Revenues (% change)	64%	3%
Average order value (% change)	13%	4%
Average order value (\$ increase)	\$13	\$5

¹⁷ NetElixir, September 2017; excludes Amazon

SHOPPERS USE DESKTOPS AND MOBILE DEVICES DIFFERENTLY

Although desktop use for back-to-school shopping activities has fallen behind mobile among US parents, desktop shoppers remain more likely to complete a purchase on that device (53%), compared to 46% of respondents who would do so via handheld devices. However, shoppers are leveraging mobile devices to collect coupons (57%), access retail sites (56%) and get price information (53%) already, not to mention that 44% are taking an extra step and dipping their toes into retailer apps.¹⁸

BACK-TO-SCHOOL SHOPPERS AND ACTIVITIES, BY DEVICE¹⁸

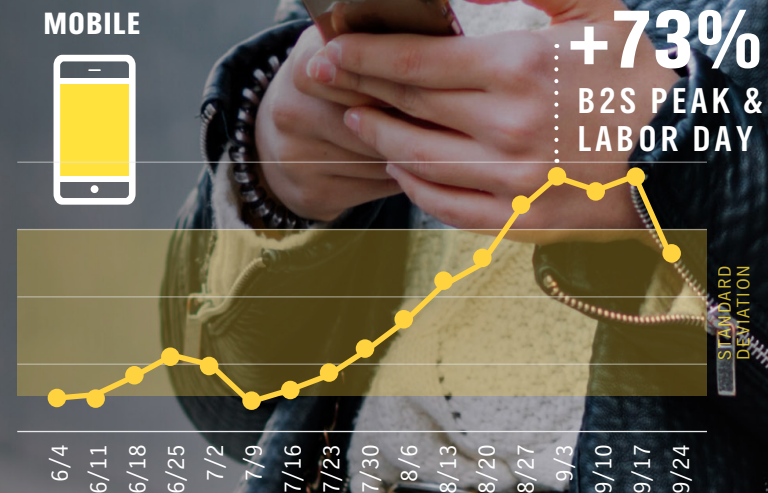
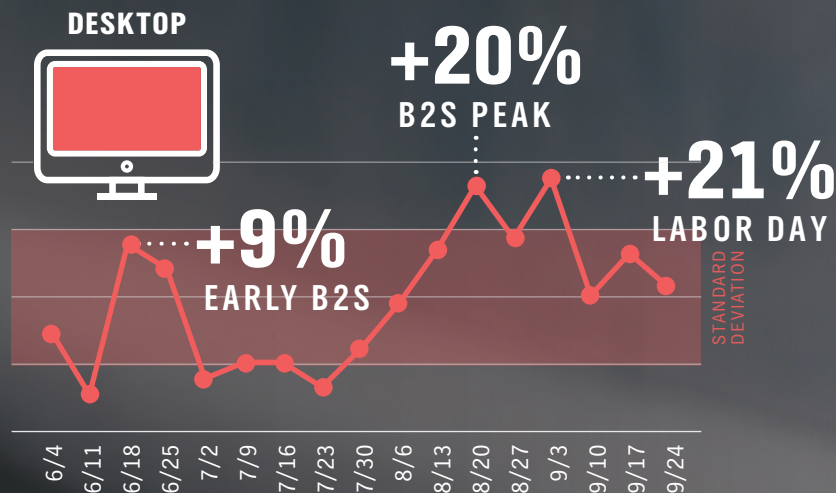


¹⁸ "2018 Back-to-School Survey – Sizing Up the Season," Deloitte, June 2018

BACK-TO-SCHOOL ADVERTISING TRENDS DIFFERED BY DEVICE

Early back-to-school advertising volume powered by PubMatic technology in the Americas focused heavily on desktops, a device where online purchases are most likely.¹⁹ The June bump in desktop advertising activity was likely an attempt to attract early birds, particularly in the US where nearly one-third of parents said they would start their back-to-school shopping by mid-July or earlier. Advertisers' incremental approach to mobile was likely due to the handheld devices being more commonly used as a source of information and less so as purchasing devices.

WEEKLY MONETIZED IMPRESSION VOLUME IN THE AMERICAS, RETAIL VERTICAL, BY DEVICE, 2018

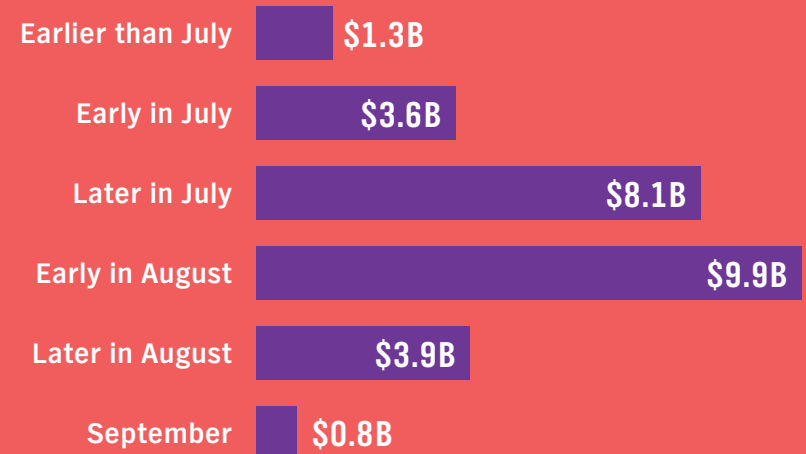


¹⁹ "2018 Back-to-School Survey - Sizing Up the Season," Deloitte, June 2018

TIMING OF BACK-TO-SCHOOL CAMPAIGNS

While some advertisers may have launched back-to-school campaigns as early as June, monetized impression volume peaked just after the second-largest shopping season of the year wrapped in late August. Consumer spending is shifting, increasingly occurring earlier in the season and through mobile web and apps.²⁰ Advertisers who incorporate these changes into their strategy going forward will be best positioned to deliver relevant, timely messaging to a new generation of shoppers during peak purchasing periods such as back-to-school and the holiday shopping season.

ESTIMATED BACK-TO-SCHOOL SPENDING AMONG US PARENT INTERNET USERS, BY TIMEFRAME, 2018²⁰



²⁰ "2018 Back-to-School Survey – Sizing Up the Season," Deloitte, June 2018

QMI Methodology

PubMatic's yield and data analytics team analyzes over 12 trillion advertiser bids on a monthly basis, utilizing the company's best-in-class analytics capabilities. The Q3 2018 QMI incorporates impressions, revenue and eCPM data from these reports to provide a high-level analysis of key trends within the mobile advertising industry. Data is from the third quarter of 2018 (i.e., July 1, 2018 to September 30, 2018), as well as the corresponding prior year periods. Analysis is based on PubMatic-sourced data except as noted. Percentages in some figures may not sum to 100% due to rounding. "Monetized impressions" or "paid impressions" are defined as impressions that were sold through the PubMatic platform, and "eCPM" is defined as the cost per one thousand impressions.

Disclaimer: This QMI may include inaccuracies or typographical errors, and is based on operational data that has not been audited or reviewed by a third party. It may contain forward-looking statements about future results and other events that have not yet occurred. Actual results may differ materially from PubMatic's expressed expectations due to future risks and uncertainties, and past performance or trends are no guarantee of future results. PubMatic does not intend to update the information contained in this QMI if any information or statement contained herein later turns out to be inaccurate.



About PubMatic

PubMatic is a publisher-focused sell-side platform for an open digital media future. Featuring leading omni-channel revenue automation technology for publishers and enterprise-grade programmatic tools for media buyers, PubMatic's publisher-first approach enables advertisers to access premium inventory at scale. Processing over 12 trillion advertiser bids per month, PubMatic has created a global infrastructure to drive publisher monetization and control over their ad inventory. Since 2006,

PubMatic's focus on data and technology innovation has fueled the rise of the programmatic industry as a whole. Headquartered in Redwood City, California, PubMatic operates 13 offices and six data centers worldwide.

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