

Q1

2017

**QUARTERLY
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 the billions of digital impressions that flow each day through PubMatic's platform, SEVEN, 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 Q1 2017, THE FOLLOWING SIX KEY TRENDS HAVE EMERGED:

KEY TREND

01

Mobile channels were highly conducive for header bidding, with monetized impression volume up 12X YOY and mobile web header bidding eCPMs rising 55% YOY in Q1.

KEY TREND

02

Mobile video eCPMs proved resilient to post-holiday season drops, increasing 7% QoQ in Q1 2017, while the news vertical saw significant increases in both mobile video impression volumes and eCPMs.

KEY TREND

03

Monetized mobile PMP impression volume rose 68% YOY in Q1 2017 with eCPMs improving 58% in the same period, reflecting continued advertiser interest in mobile PMP transactions.

KEY TREND

04

The impression volume gap between mobile web and mobile app virtually disappeared in Q1 2017; mobile app inventory continued to yield higher eCPMs, but mobile web eCPMs proved more resilient to seasonal pricing swings.

KEY TREND

05

Android's share of monetized mobile app impressions continued to expand globally to reach 71% in Q1 2017, nearly doubling in size YOY, though iOS produced the highest eCPMs once again.

KEY TREND

06

The mobile programmatic opportunity remained front and center in each global market, with EMEA standing out with a 14% increase in monetized mobile impressions and 69% higher eCPMs YOY.

WHAT DOES THIS MEAN FOR PUBLISHERS AND ADVERTISERS?

1

The benefits of header bidding for mobile publishers grow as technology providers continue to innovate.

Header bidding technology is evolving beyond the header this year, as evidenced by recent announcements from PubMatic and others about in-app, server-side and video header bidding solutions. Mobile publishers are well positioned to take advantage of these innovations as analysis shows that the mobile share of header bidding impressions is growing faster than desktop. Advertisers, too, are reaping benefits from the proliferation of header bidding, as the technology enables sophisticated buying strategies for brands, such as Biddable IO—the execution of direct buys through programmatic pipes via header bidding connections with publishers.

2

Video opportunities rise as more brand spend shifts to programmatic channels, with mobile providing a stable environment for growth.

Despite the fact that desktop remains the main driver of programmatic video impressions,¹ mobile platforms have proved to be a viable contender for brands' digital video spend. Mobile screens have become mainstream for video consumption, a status that has brought about new possibilities for advertisers who strike the right video balance across the different digital screens. Mobile publishers are already benefiting from heightened mobile video consumption. But the continuation of this opportunity will only be possible with a robust ad decisioning infrastructure that enables the delivery of quality ads and content to a relevant audience.

3

Mobile private marketplaces continue to thrive.

Inventory quality and brand safety remain a central focus for advertisers in 2017, with 50% of US digital marketers citing media quality (including brand safety, ad fraud and viewability) as a leading challenge of media buying.² When coupled with the increasingly mobile-first consumer base, mobile private marketplaces (PMPs) are particularly well suited to address these quality concerns. Hence, demand for and investment on transactions through this channel are on a long-term upswing. Digital content providers who carefully refine their mobile PMP offer will be better prepared to address advertisers' growing demand for good old (and relevant) human traffic and scale.

4

Android on the top of the OS game.

The chief operating system is more dominant than ever, and a plurality of consumers continue to purchase devices powered by Android. Tracking this trend, advertising volume targeting the operating system took a huge leap at the beginning of 2017 that gave it an unprecedented market share. Apple remained the only other sizeable competitor in the category, still yielding higher eCPMs. But the premiums aren't what they used to be. More than ever, the current mobile OS market profile demands that digital media buyers and publishers carefully balance their mobile mix, going beyond the pricing-vs.-reach rationale to put detailed goals at the center of their strategy and further leverage the robust in-app targeting capabilities each operating system offers.

KEY TREND

01

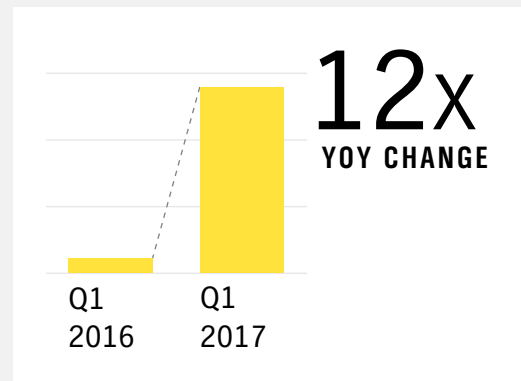
Mobile channels were highly conducive for header bidding, with monetized impression volume up 12X YOY and mobile web header bidding eCPMs rising 55% YOY in Q1.

Header bidding remains one of the most talked about programmatic advertising technologies of 2017, and with good reason. Overall monetized impression volume transacted using header bidding technology across desktop and mobile devices more than quadrupled between Q1 2016 and Q1 2017. Header bidding inventory shown on desktops represented the bulk of the market, but mobile monetized impressions expanded at a faster pace, growing more than 12X YOY. Hence, the desktop-to-mobile web monetized header bidding inventory balance shifted from a 93%-7% split in Q1 2016 to 76%-24% shares so far this year.

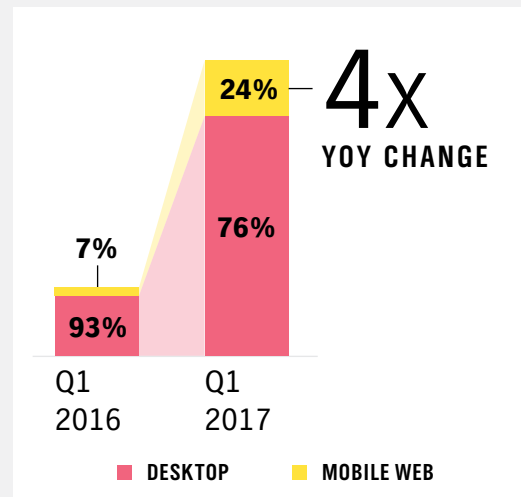
The acceleration of header bidding towards mobile is only natural considering that already more than half of digital ad spending in the US was earmarked for the channel in 2016.³ Global mobile ad spending is expected to grow 31% YOY to reach \$106 billion in 2017, with nearly half of that total to be executed in the US.⁴

Spurring the expansion of mobile header bidding across the PubMatic platform was the introduction of the technology in APAC in Q2 2016. In the three quarters since its release in that region, APAC's share of monetized mobile header bidding impressions reached 4% worldwide. Meanwhile, EMEA maintained an 8% share of the total in Q1 2017 as it did in the same period last year.

Monetized Mobile Web Header Bidding Impression Volume

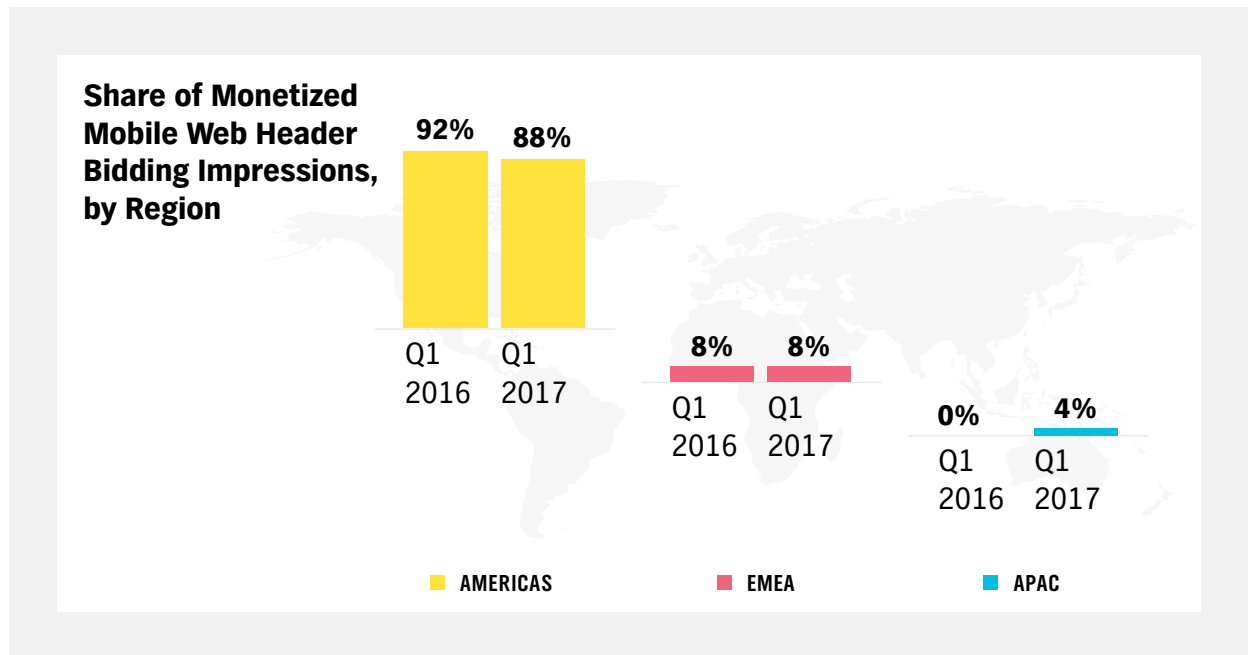
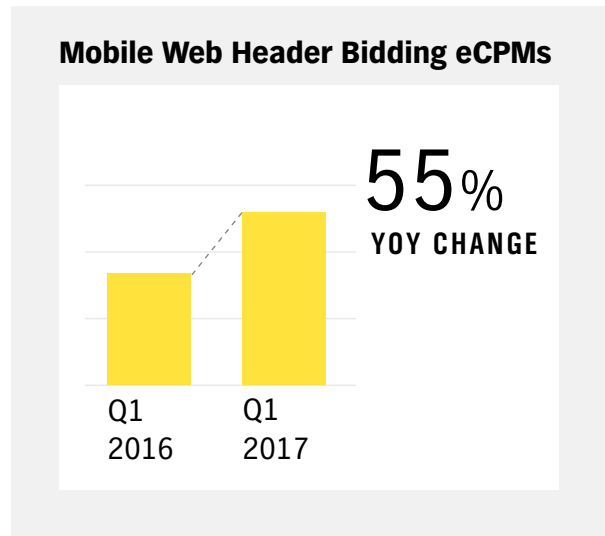


Monetized Header Bidding Impression Volume & Platform Share



KEY TREND #1 CONT.

Header bidding eCPMs across mobile web inventory were up 55% YOY. The upward trend fuels the expectation that volume of mobile impressions transacted via header bidding will continue to rise as more mobile web publishers adopt the technology. The introduction of the technology into the mobile app market should also enhance its impact on publisher monetization strategies throughout 2017.



KEY TREND

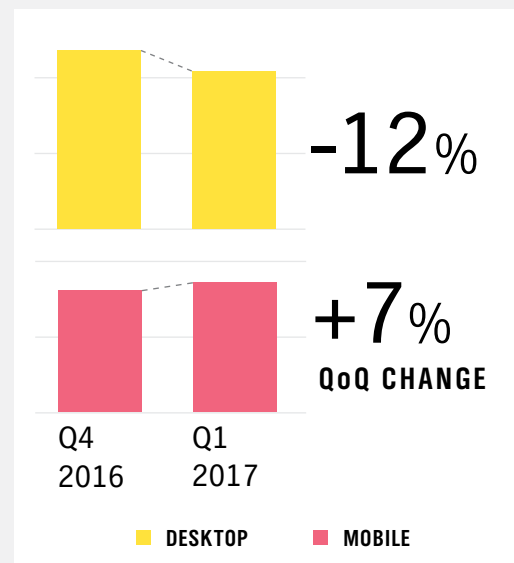
02

Mobile video eCPMs proved resilient to post-holiday season drops, rising 7% QoQ in Q1 2017, while the news vertical saw significant increases in both monetized mobile video impression volumes and eCPMs.

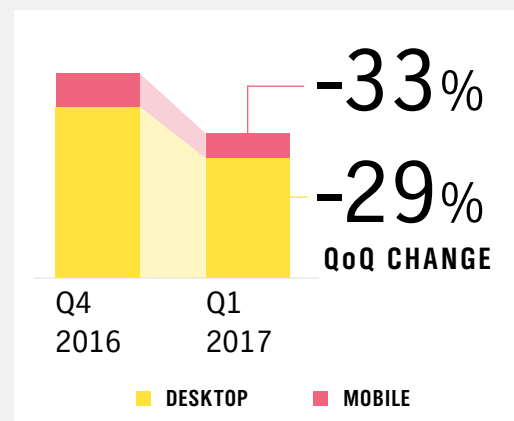
We continue to see programmatic video opportunities grow as more brands shift their ad spend to automated channels. According to PubMatic CMO, Jeff Hirsch, “brand advertisers are big video advertisers. Juxtapose that [increased demand] against the constraints of supply, and prices continue to be pushed up.” While desktop video eCPMs decreased some 12% following the Q4 holiday season, mobile video eCPMs were up 7% QoQ in Q1 2017.

Post-holiday season volume drops are not uncommon, and Q4 2016 also saw major spikes in video ad spend due to the US presidential election, which only added to an expected drop following the new year. Further, Q1 2017 was also plagued by a string of video inventory quality concerns industrywide which caused many video buyers to pause spend and led to a brand boycott of YouTube inventory in March, after ads inadvertently appeared alongside extremist content. In Q1 2017, we saw the number of monetized video ad impressions served across our platform decrease by nearly one-third QoQ. Both mobile and desktop platforms saw quarterly drops in monetized inventory volume to the tune of 33% and 29%, respectively.

Average Video eCPMs, by Platform



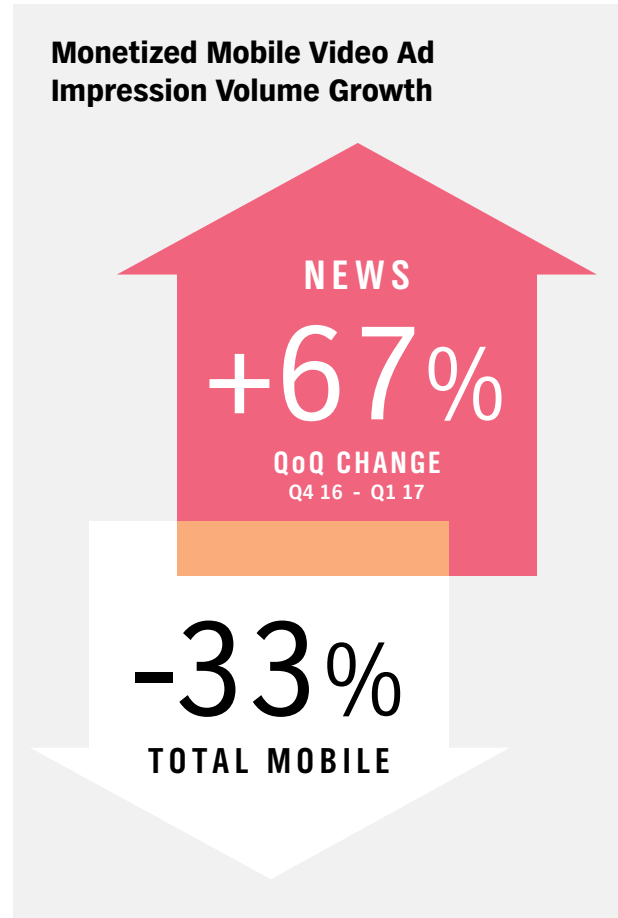
Monetized Video Ad Impression Volume, by Platform



KEY TREND #2 CONT.

Nearly all verticals experienced the reduction, but the silver lining came from the news category which finished the quarter with a 67% QoQ monetized impression volume bump. Whether the site focused on weather, politics, general information or were owned by a newspaper, audiences for news and information properties online were on the rise in 2016.⁵ What's more, younger users were far more likely to get their news via properties with a nationwide footprint and to do so primarily via mobile devices.⁶ While more recent research was not available in time for this report, it is not far-fetched to speculate that the 2016 trends may have carried over into 2017.

We expect the news vertical to be a harbinger for a positive outlook for digital video spend on mobile platforms, as a recent IAB study found that 62% of advertisers plan to increase investment in mobile video over the next 12 months,⁷ and mobile video ad spend is expected to exceed \$6 billion by the end of the year.⁸



KEY TREND

03

Monetized mobile PMP impression volume rose 68% YOY in Q1 2017 with eCPMs improving 58% in the same period, reflecting continued advertiser interest in mobile PMP transactions.

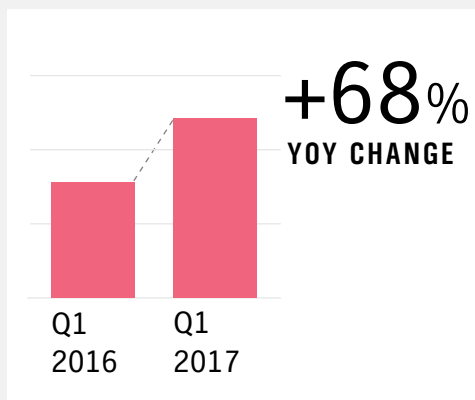
Inventory quality and brand safety remain a central focus for advertisers in 2017. When coupled with the increasingly mobile-first consumer base, mobile private marketplaces (PMPs) are particularly well suited to address these quality concerns. Hence, demand for and investment on transactions through this channel are on a long-term upswing.

Mobile PMP volume and outlays normally experience a dip in the first quarter of the year when compared to Q4, a period when ad spending is supercharged by the holiday shopping season and, in the case of 2016, a US presidential election. Despite this seasonal dip, monetized mobile PMP impression volume rose 68% in Q1 2017, as compared to Q1 2016, adding to a streak that now spans five quarters of YOY growth in succession.

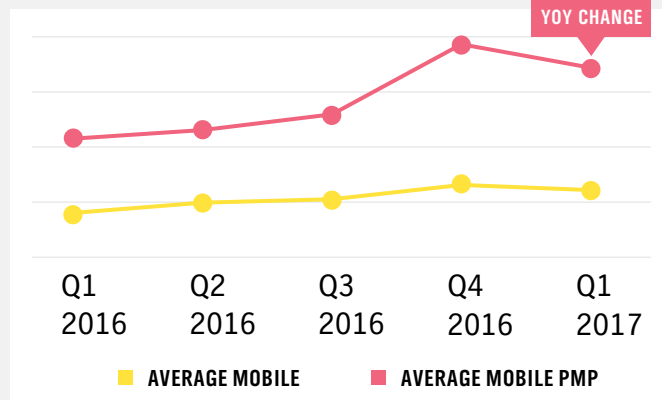
This quarter's monetized volume was also 9X higher than it was two years previously, in Q1 2015. We expect a continuation of the upward trend in monetized mobile PMP inventory gains as demand for deals through this channel broadens among advertisers.

The increase in monetized mobile PMP volume has not significantly diminished the pricing advantage of private marketplaces over the mobile programmatic average, which includes both open exchanges and PMP deals. Mobile PMP eCPMs rose 58% YOY in Q1 2017 to yield nearly 3X the returns of overall mobile programmatic ad inventory. As more brand advertising spend shifts to programmatic channels, we expect the prevalence of mobile PMP transactions to continue to rise.

Monetized Mobile PMP Impression Volume



Average eCPMs, Mobile PMP vs. Total Mobile



KEY TREND

04

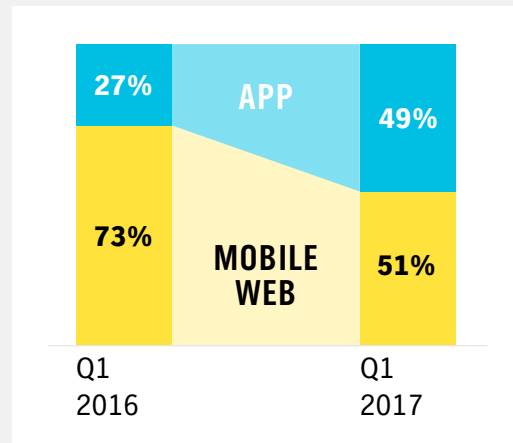
The impression volume gap between mobile web and mobile app virtually disappeared in Q1 2017; monetized mobile app inventory continued to yield higher eCPMs, but mobile web eCPMs proved more resilient to seasonal pricing swings.

Consumers who access the internet via mobile devices do so primarily via apps. And the already wide gap between time spent on mobile web and apps is getting wider. According to eMarketer, US mobile app users will spend an average 185 minutes per day on that channel in 2017, up from 176 minutes in 2016. On the other hand, average time spent on the mobile web will drop slightly, from 35 minutes per day in 2016 to 33 minutes this year.⁹

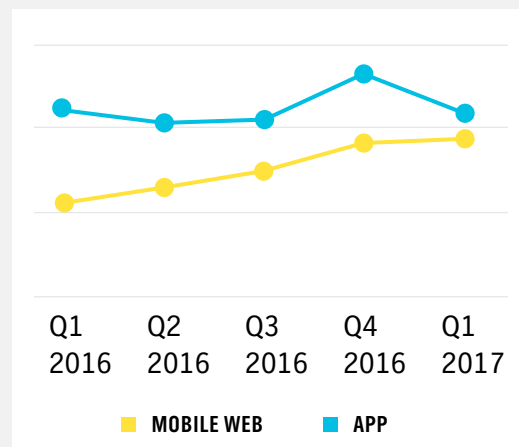
Following this consumer trend, the mobile app share of monetized mobile impressions has consistently expanded since 2015. The trend intensified in the last twelve months to virtually erase the gap with mobile web; mobile app's share of volume rose to 49% of monetized mobile impressions in Q1 2017, up from 27% at the same point a year ago.

Mobile apps loaded with more robust targeting capabilities have long produced higher eCPMs than their mobile web counterparts.¹⁰ Q1 2017 was no exception, as mobile app impressions garnered eCPMs 15% higher than those served through the mobile web. That margin, however, was down from a 93% premium paid for mobile app impressions over mobile web in Q1 2016. This trend highlights the more mature and commoditized state of mobile web advertising, making eCPMs for the channel less susceptible to seasonal fluctuations and emphasizing the need for a diversified channel mix.

Share of Monetized Mobile Impressions, by Mobile Web vs. App



Average eCPMs, Mobile Web vs. App



KEY TREND

05

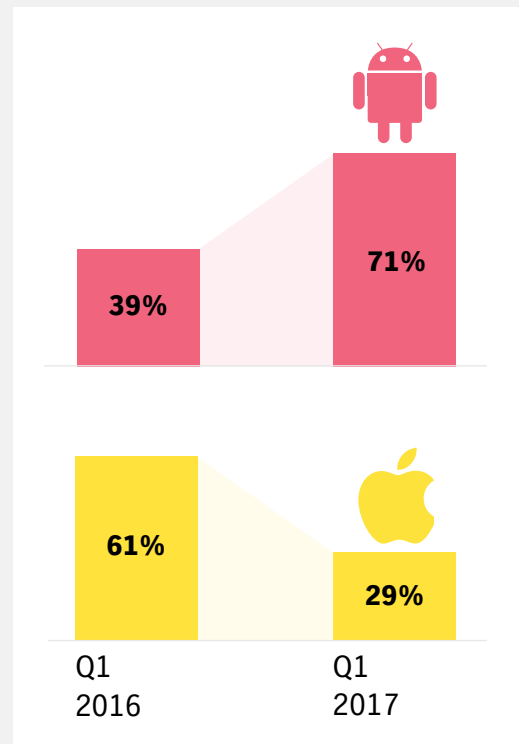
Android's share of monetized mobile app impressions continued to expand globally to reach 71% in Q1 2017, nearly doubling in size YOY, though iOS produced the highest eCPMs once again.

Consumer preference for Android operating systems remains strong in all major markets worldwide. Android-powered devices represented three-quarters or more of the smartphones sold in France, Germany, Italy and Spain in February 2017. Sales of advanced mobile phones in Australia, Japan, the US and the UK were also dominated by Android, but its share of the sales in those markets was below the 60% mark during the same period.¹¹

Tracking consumer trends, Android continued to gain relevance among mobile advertisers and publishers in the opening months of the year. In fact, Android is now in a dominant mobile advertising position with nearly three-quarters (71%) of all monetized mobile ad impressions that were served across the PubMatic platform globally in Q1 2017, up from 39% a year ago.

Driving Android's global market share gains in mobile app impressions were APAC and EMEA, where the volume of monetized impressions expanded 261% YOY and 814% YOY respectively in Q1 2017. Against the background of such heated expansion in these regions, the solid 67% YOY increase registered in the Americas looked outright modest. By comparison, all regions experienced double-digit reductions in mobile app impressions for iOS devices.

Share of Monetized Mobile App Impressions, by OS

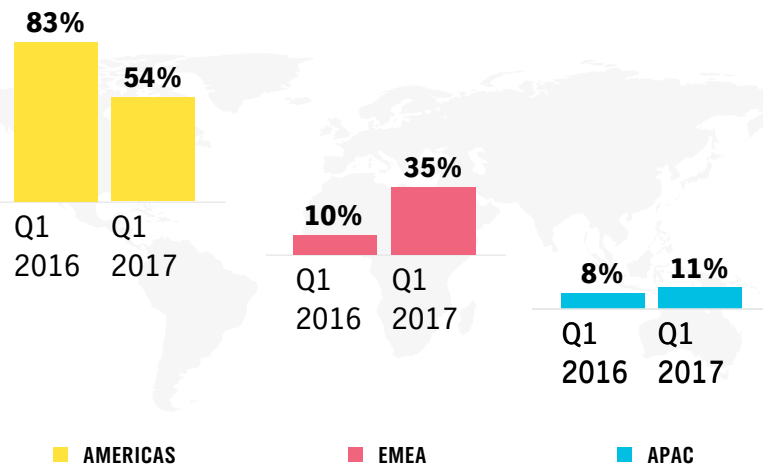


KEY TREND #5 CONT.

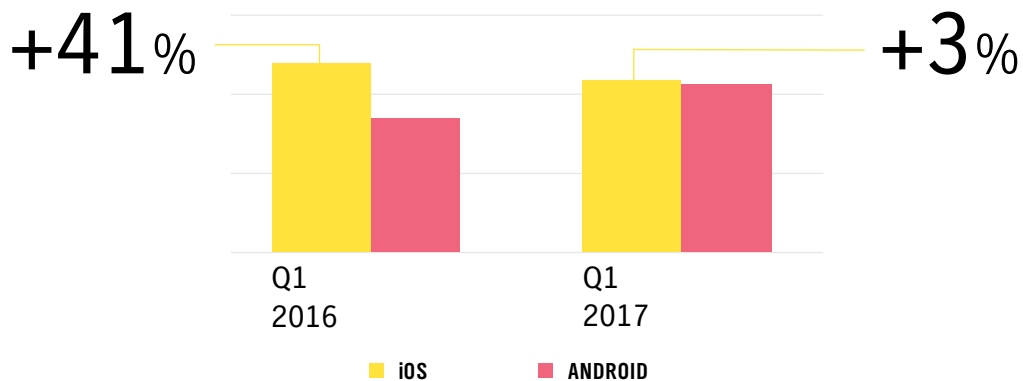
On the Android front, regional market shares changed to an even greater extent. EMEA concentrated more than one-third (35%) of monetized impressions landing in devices powered by Android in Q1 2017, more than tripling the slice in only one year. With APAC's share up three percentage points as well, the portion of monetized Android impressions served in the Americas stood at 54% of the worldwide total, down from 82% in Q1 2016.

Mobile app impressions shown via Apple devices produced the highest eCPMs once again in Q1 2017 after being edged in Q4 2016, but the premium paid for iOS inventory was a negligible 3% this quarter, down from 41% and 128%, respectively, in Q1 2016 and Q1 2015. Behind the vanishing Apple ad premium was a 9% YOY dip in eCPMs for impressions served to iOS devices in Q1 2017 with Android eCPMs surging 25% during the same period.

Share of Monetized Android Mobile App Impressions, by Region



Average Mobile App eCPMs, iOS vs. Android



KEY TREND

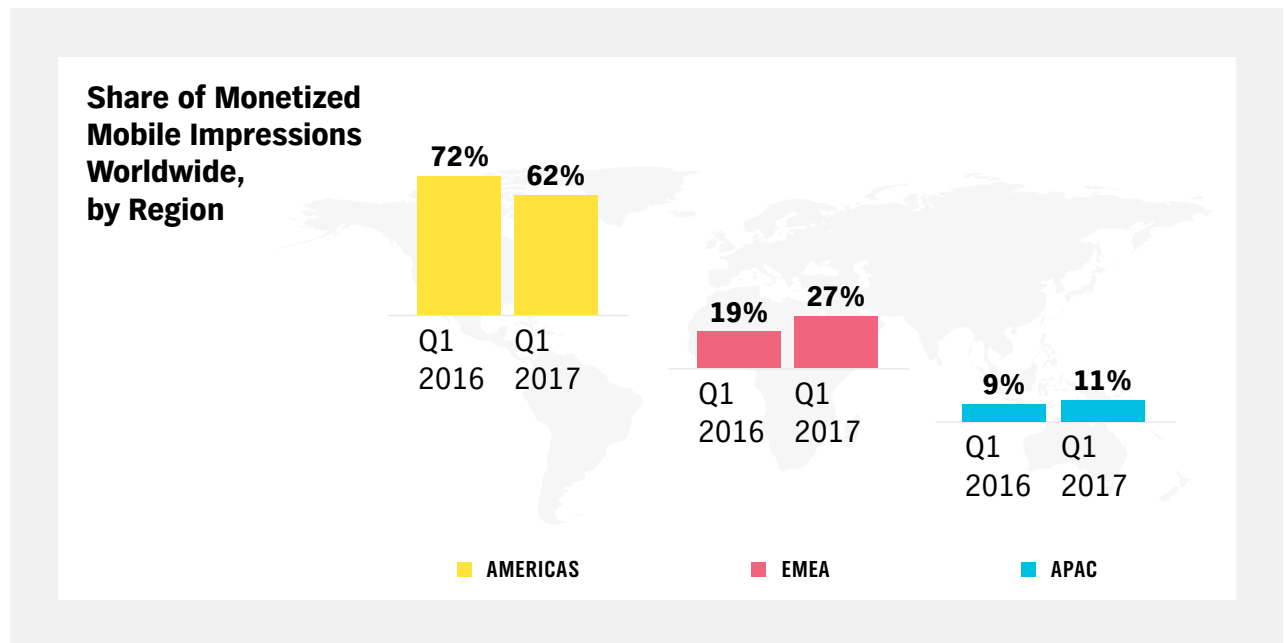
06

The mobile programmatic opportunity remained front and center in each global market, with EMEA standing out with a 14% increase in monetized mobile impressions and 69% higher eCPMs YOY.

Each global region saw an increase in mobile eCPMs in Q1 2017 as compared to the year prior, though EMEA saw the greatest growth across both monetized inventory and eCPMs. EMEA's pool of monetized mobile impressions was up 15% QoQ in Q1 2017, making it the eighth quarterly expansion in the last nine terms. Mobile impression volume in EMEA was up 14% YOY in Q1 2017.

monetized through PubMatic's technology worldwide, up from 19% in Q1 2016. It is worth noting that APAC's share has also expanded to reach 11% in the opening quarter of 2017, up from 9% a year prior. This globalizing process has resulted in the portion of monetized ads served in the Americas dropping to under two-thirds in Q1 2017, down from nearly three quarters (72%) during the same period in 2016.

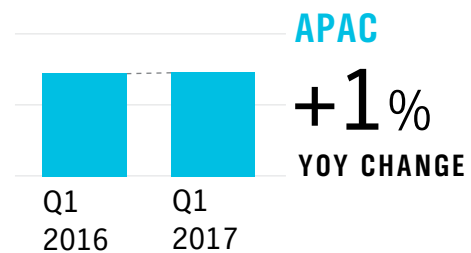
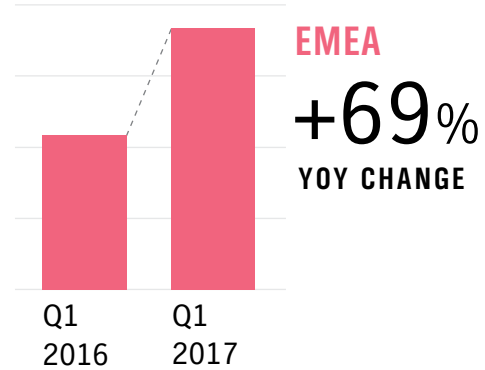
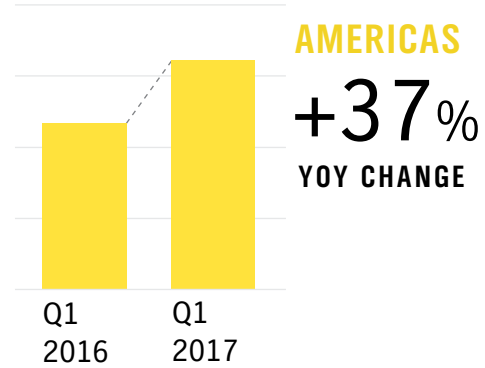
Resulting from over two years of consistent inventory growth in EMEA, the region now represents 27% of mobile ad impressions



KEY TREND #6 CONT.

Although rapid inventory growth may sometimes result in down pressure over price, average eCPMs remained in a positive trajectory across all regions. EMEA registered a 69% YOY eCPM bump in Q1 2017, followed by the Americas with a solid 37% YOY improvement. eCPM growth was essentially flat in APAC, rising approximately 1% YOY.

Average Mobile eCPMs Worldwide, by Region





QMI Methodology

PubMatic's yield and data analytics team analyzes billions of impressions on a daily basis, utilizing the company's best-in-class analytics capabilities. The Q1 2017 QMI incorporates impressions, revenue and eCPM data from these daily reports to provide a high-level glimpse of key trends within the mobile advertising industry. Data is from the first quarter of 2017 (January 1, 2017 through March 31, 2017), and calendar year 2016 (January 1, 2016 through December 31, 2016), as well as corresponding prior year periods. "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.

^{1,10} "Digital Ad Pricing Stat Pack," Catherine Boyle, eMarketer, April 2017

² ADI Summit Survey 2017 as cited in Adobe Digital Insights, "Advertising Report," March 2017

³ "IAB 2016 Full Year Report," Interactive Advertising Bureau, April 2017

⁴ [Jumpshot](#), as cited by Erik Sass, Media Post, January 2017

⁵ "[The State of Mobile News Audiences in 3 Charts](#)," Adam Lella, comScore, July 2016

⁶ "[American Trends Panel](#)," Pew Research Center, February 2017

⁷ "[IAB Video Ad Spend Study: 2017 NewFronts](#)," Interactive Advertising Bureau, April 2017

⁸ "[Five Bleeding-Edge Mobile Marketing Trends in 2017](#)," Julie Bernard, AdAge, Jan 2017

⁹ "US Time Spent with Media: eMarketer's Updated Estimates and Forecast for 2014-2019," Mark Dolliver, eMarketer, April 2017

¹¹ "[iOS and Android push towards a Two-OS world](#)," Kantar Worldpanel, Feb 2017



About PubMatic

PubMatic is the automation solutions company for an open digital media industry. Featuring the leading omni-channel revenue automation platform for publishers and enterprise-grade programmatic tools for media buyers, PubMatic's publisher-first approach enables advertisers to access premium inventory at scale. Processing nearly one trillion ad impressions per month, PubMatic has created a global infrastructure to activate meaningful connections between consumers, content and brands. Since 2006, PubMatic's focus on data and technology innovation has fueled the growth of the programmatic industry as a whole. Headquartered in Redwood City, California, PubMatic operates 11 offices and six data centers worldwide.

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