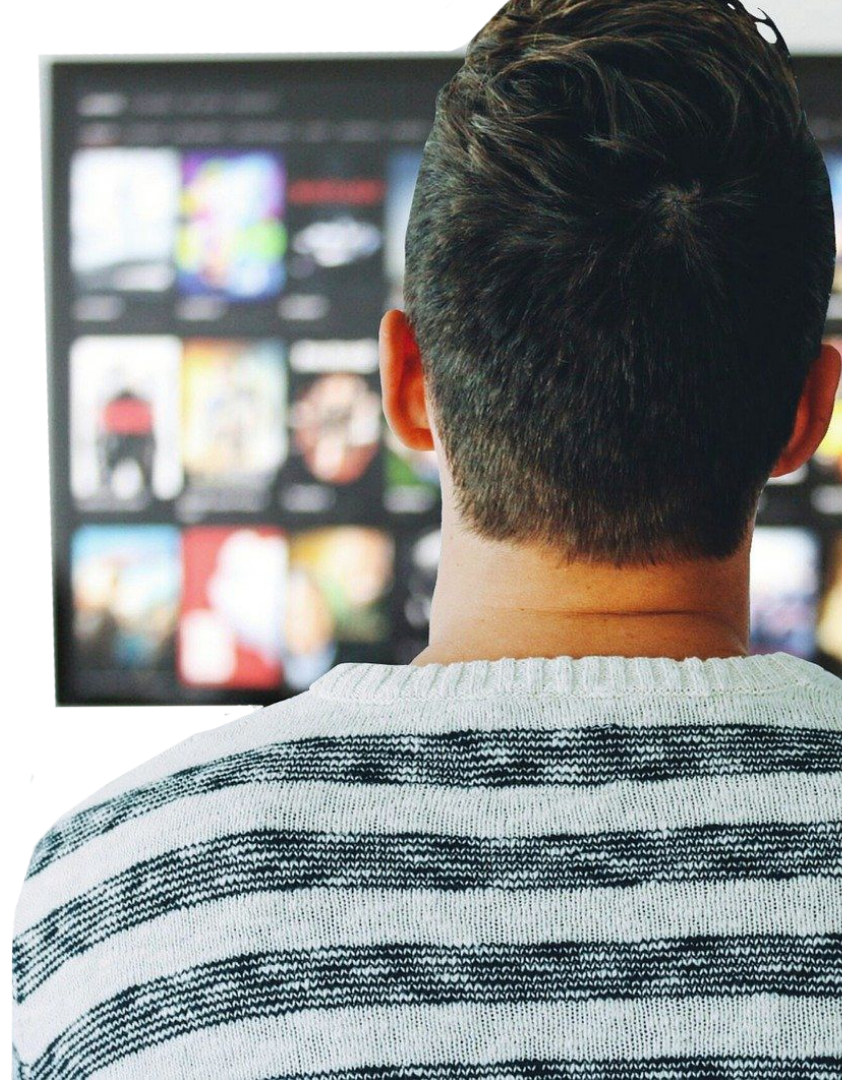




# GLOBAL CONNECTED TV (CTV) AD SUPPLY CHAIN TRENDS

**Q1.2023**

An analysis of the state of open programmatic CTV advertising, including top devices, trending categories, and ad fraud risk



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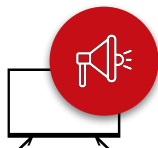
## A NOTE ABOUT THIS CTV RESEARCH

Pixalate’s data science team analyzed programmatic advertising activity across over 300 million Connected TV (“CTV”) devices to compile this research. Pixalate’s datasets consist predominantly of buy-side open auction programmatic traffic sources.

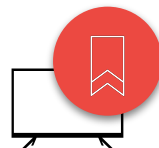
Pixalate is sharing this data not to impugn the standing or reputation of any person, entity or app, but, instead, to render opinions and report trends pertaining to CTV apps.



# Q1 2023 TRENDS: REACH, AD SPEND & DEVICE MARKET SHARE



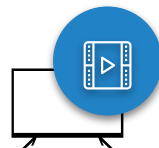
**98% of U.S. households reachable** via open programmatic CTV ads



**Android OS** +69% YoY for OS market share; **LG** rose 320%



**\$3.2 billion** in estimated global open programmatic **CTV ad spend** in Q1 2023



**Roku devices hold 46%** market share of open programmatic CTV ad spend



**+15% YoY** in open programmatic **CTV ad spend** in **APAC**.



**Sports** saw **100%+ YoY** market share growth on both Roku and Amazon Fire TV

CTV TRENDS

# THE STATE OF THE AD MARKETPLACE

Household Reach | Ad Spend | Ad Fraud

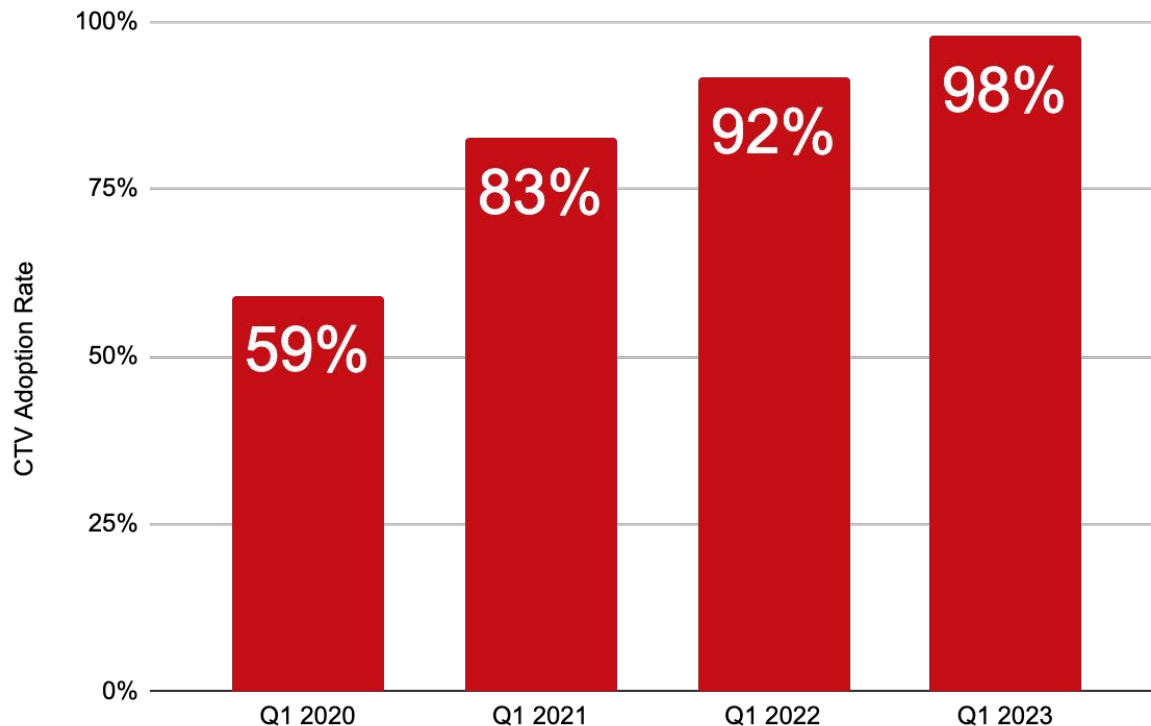


# +6%

YoY rise in overall percentage of internet-connected U.S. households that were reachable via open programmatic CTV ads, according to Picalate's data.

## US HH Reach: 98% REACHABLE VIA PROGRAMMATIC CTV

Estimated % of U.S. internet-connected households reachable by open programmatic CTV advertising as of Q1 2023; as measured by Picalate



# CTV AD SPEND: TOP GROSSING CTV APPS Q1 2023

Top 5 grossing CTV apps per platform based on estimated open programmatic advertising in Q1 2023, as measured by Pixalate



Q123 Rank

App

1	
2	
3	
4	
5	



Q123 Rank

App

1	
2	
3	
4	
5	

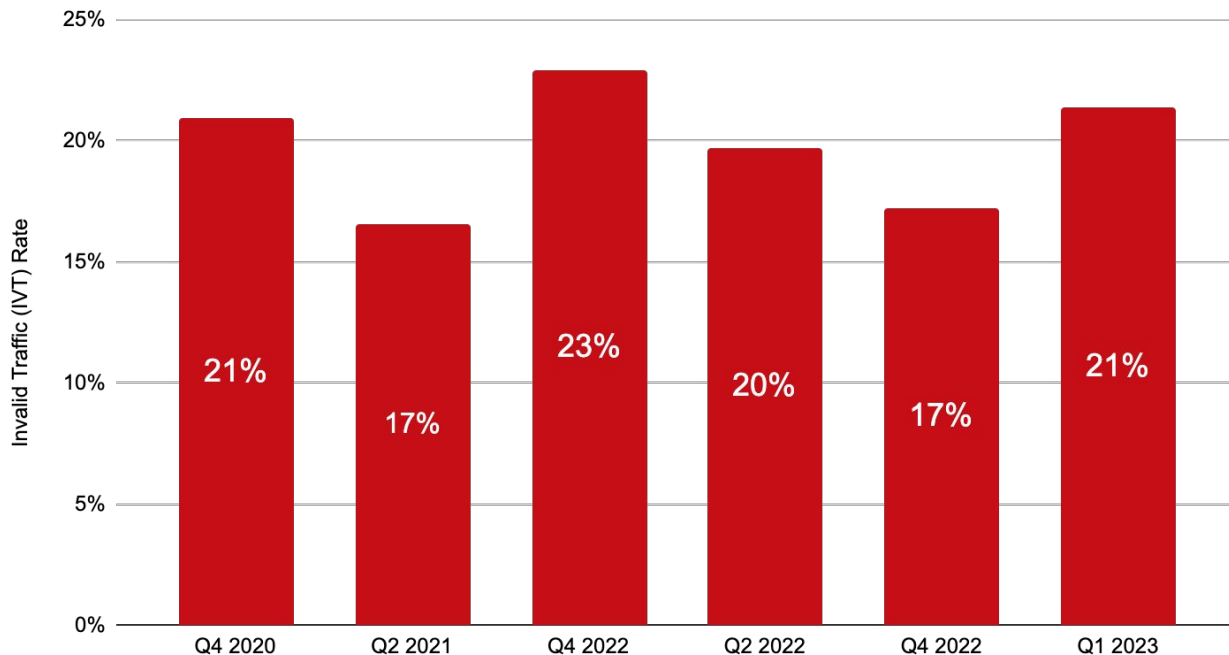


# ~20%

invalid traffic (IVT) rate in the open programmatic CTV ad marketplace went back over 20% in Q1 2023 after going under the threshold in Q4 2022, according to Pixalate's data.

## CTV INVALID TRAFFIC CONTINUES TO HOVER AROUND 20%

Invalid traffic ("IVT" - inclusive of ad fraud) by quarter in open programmatic CTV; global; as measured by Pixalate





CTV WORLDWIDE

# GLOBAL AD SPEND TRENDS

North America | APAC | EMEA | LATAM





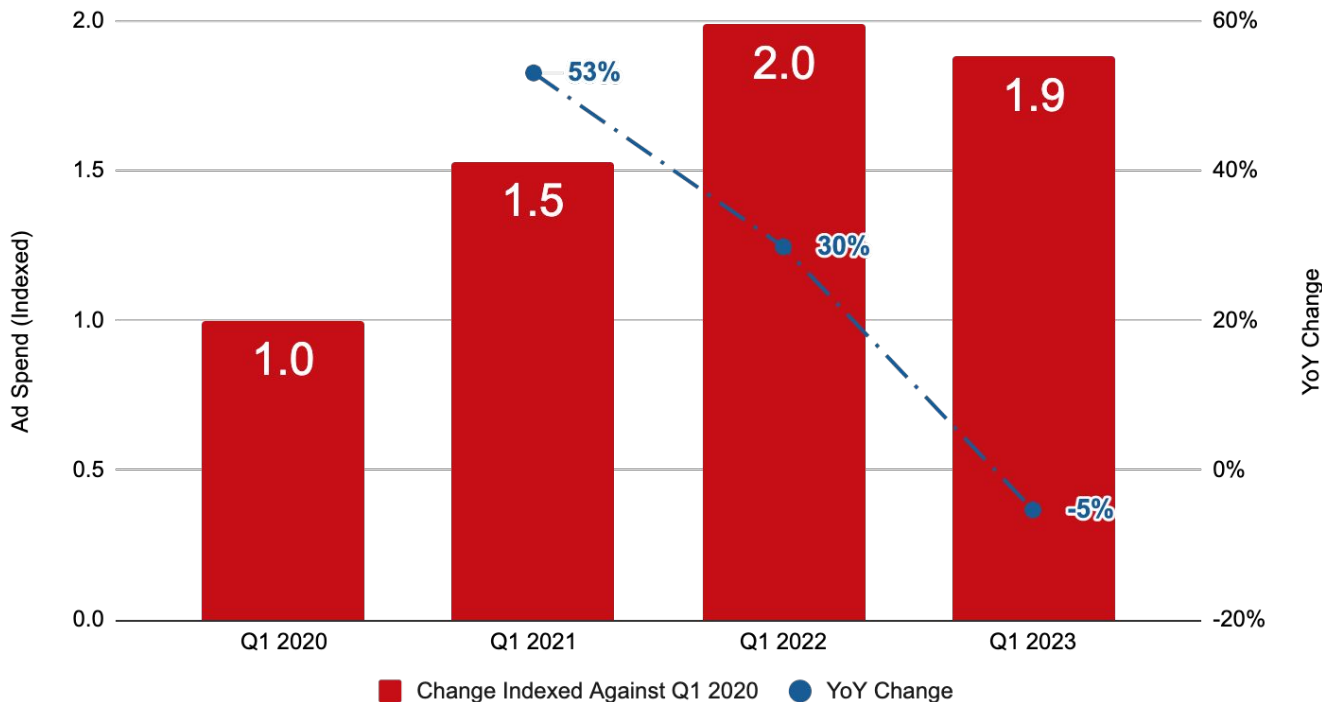


# -5%

The North American CTV ad marketplace followed the same trend as the global marketplace, showing no growth in Q1 2023 vs. Q1 2022.

## NORTH AMERICA: CTV AD SPEND FLAT

Open programmatic ad sales proxied for ad spend, as measured by Pixalate



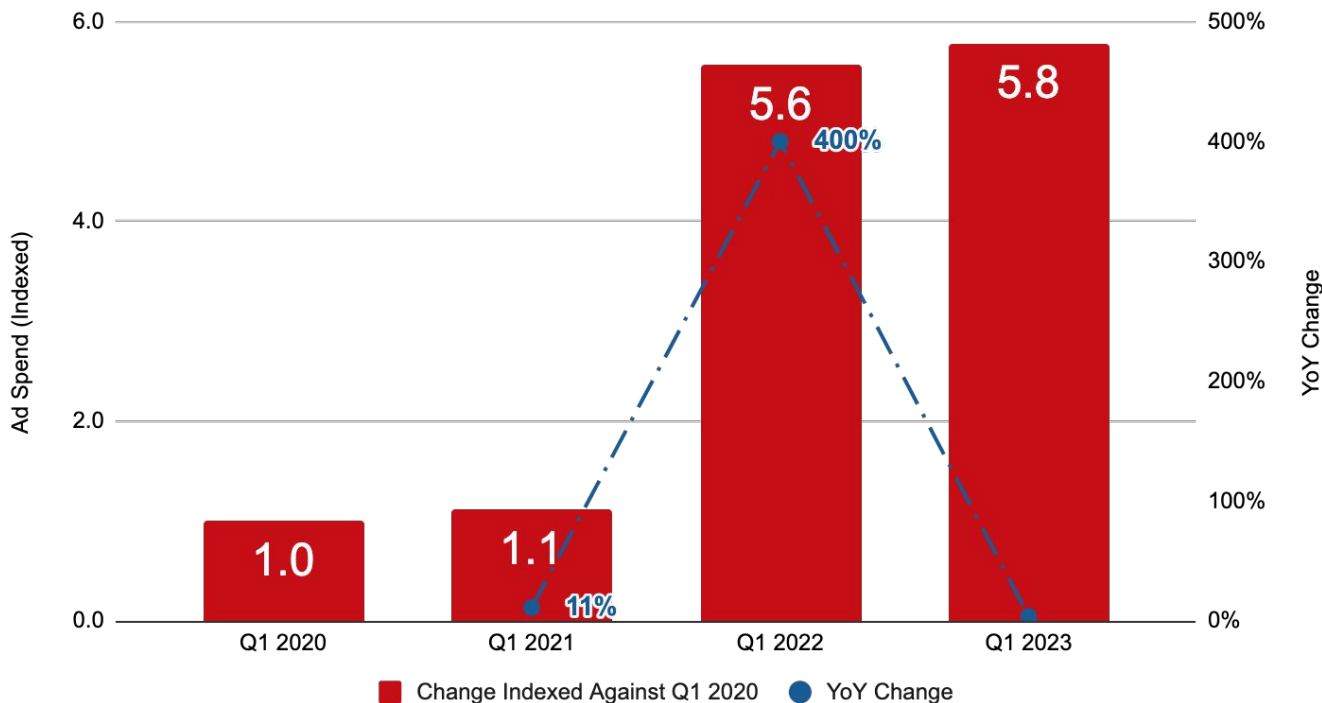


# 4%

rise in open programmatic CTV ad spend in EMEA compared to Q1 2022, a flat year consistent with the global pattern, according to Pixalate's data.

## EMEA: CTV AD SPEND FLAT AFTER MASSIVE GROWTH IN 2022

Open programmatic ad sales proxied for ad spend, as measured by Pixalate



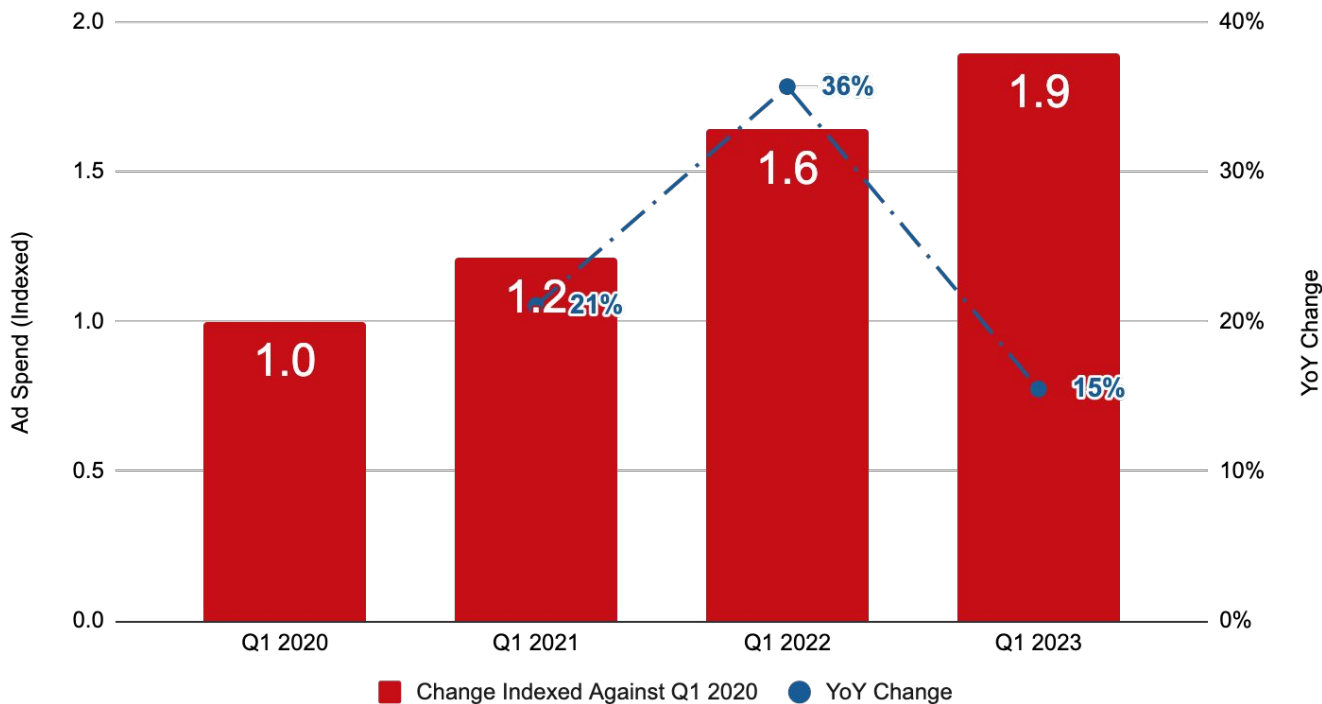


# 1.9X

rise in open programmatic CTV ad spend in APAC compared to Q1 2020, with YoY growth of 15%, according to Picalate's data.

## APAC: CTV AD SPEND UP 15% YoY

Open programmatic ad sales proxied for ad spend, as measured by Picalate



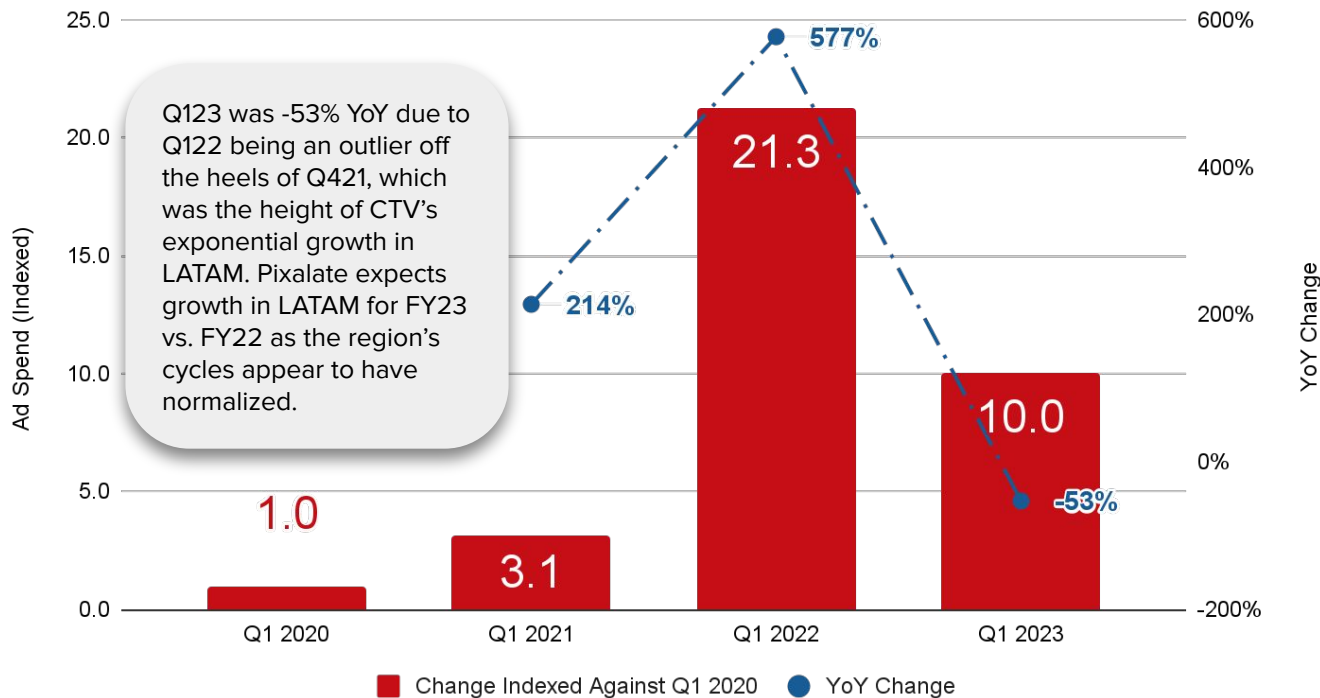


# 10x

rise in open programmatic CTV ad spend in LATAM compared to Q1 2020, but YoY spend dropped 53%, according to Pixalate's data

## LATAM: RIPPLE EFFECTS FROM 2021 GROWTH SPURT CONTINUE

Open programmatic ad sales proxied for ad spend, as measured by Pixalate



CTV DEVICES

# AD SPEND TRENDS BY DEVICE TYPE

Roku | Amazon Fire TV | Apple TV | Chromecast | Smart TVs







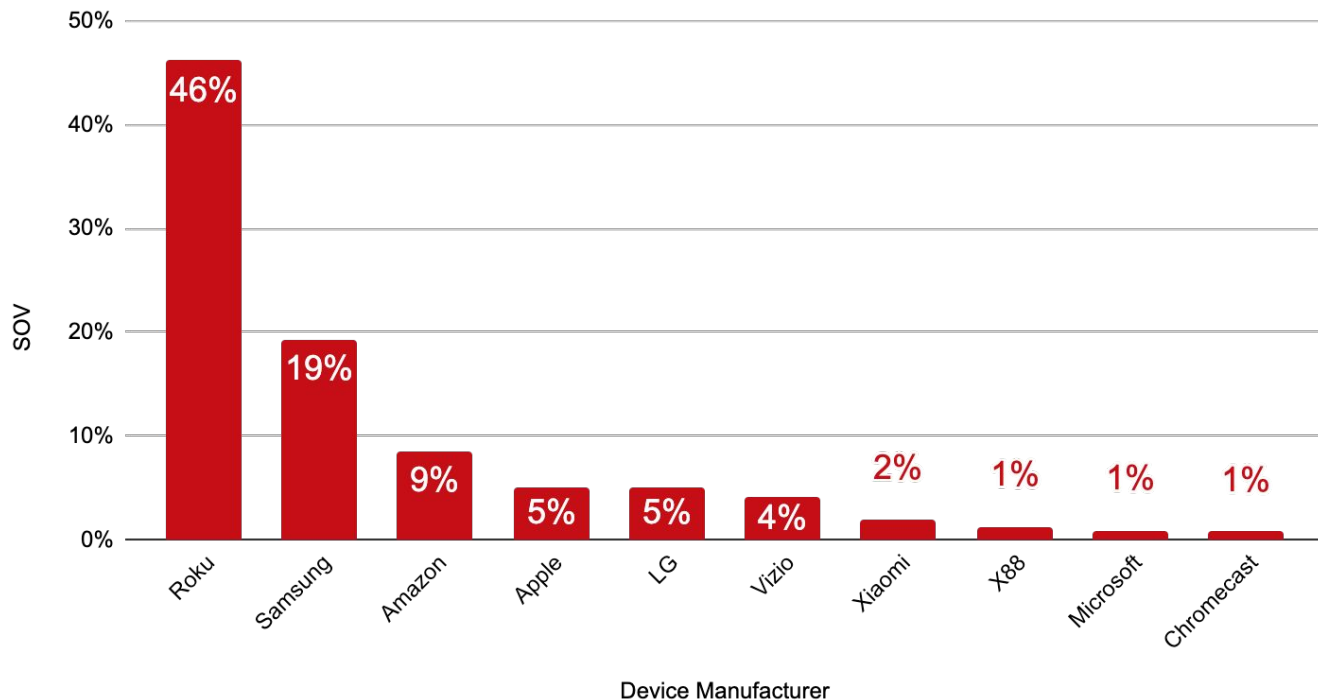
# 46%

open programmatic CTV ad sale share of voice for Roku devices, while Samsung widened its lead as the No. 2 device, according to Pivalate's data.

*What this stat means: 46% of all open programmatic CTV ads, as measured by Pivalate, were delivered to Roku devices.*

## SAMSUNG LEAPS TO 19% MARKET SHARE

Share of voice of open programmatic ads sold by device type; global; Q123; as measured by Pivalate



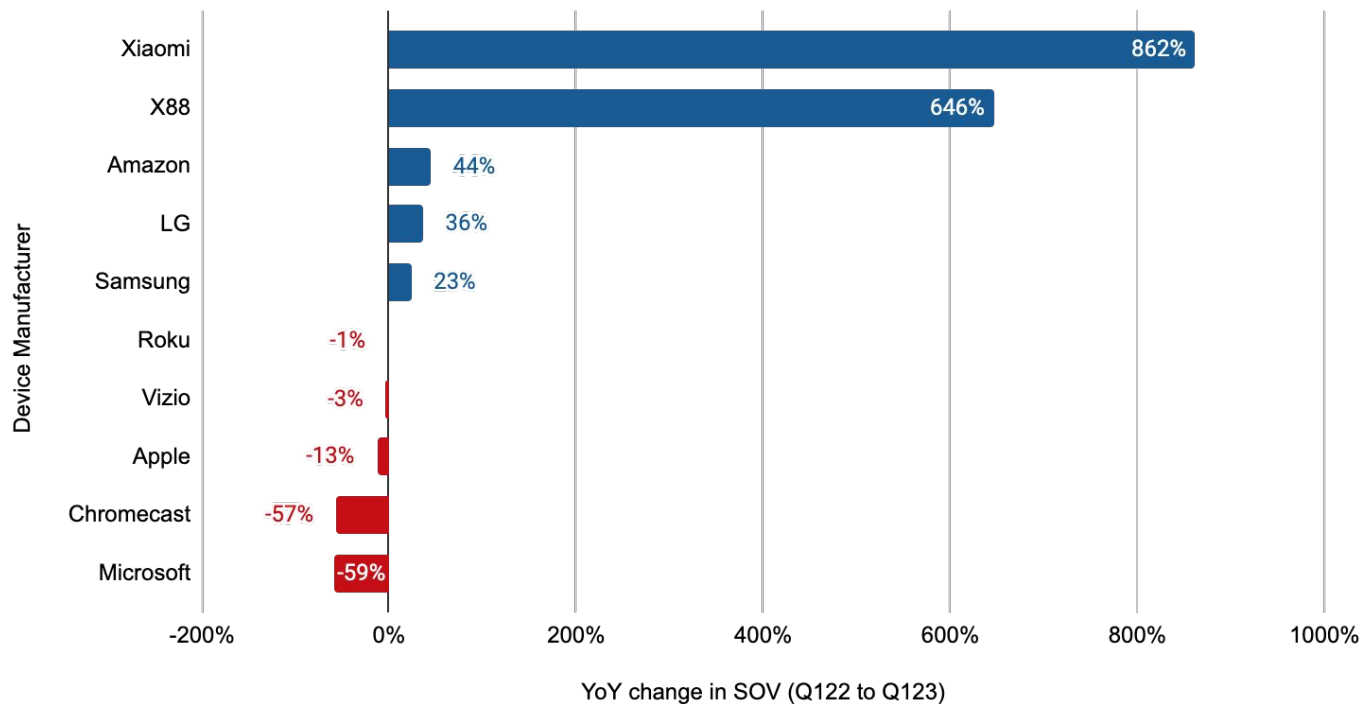
# 44%

YoY open programmatic CTV ad market share gain for **Amazon** devices, according to Picalate's data.

Chinese-based device makers **X88** and **Xiaomi** are rising fast, though as of Q1 2023, combined they make up just 3% of the marketplace.

## AMAZON UP 44% YoY, SAMSUNG RISES 23%

% change in SOV of open programmatic CTV ads sold from Q122 to Q123 by device type; global; as measured by Picalate





**Roku**<sup>®</sup>

ROKU CHANNEL STORE

# OPEN PROGRAMMING AD TRENDS

App Growth | Open Programmatic | App Categories



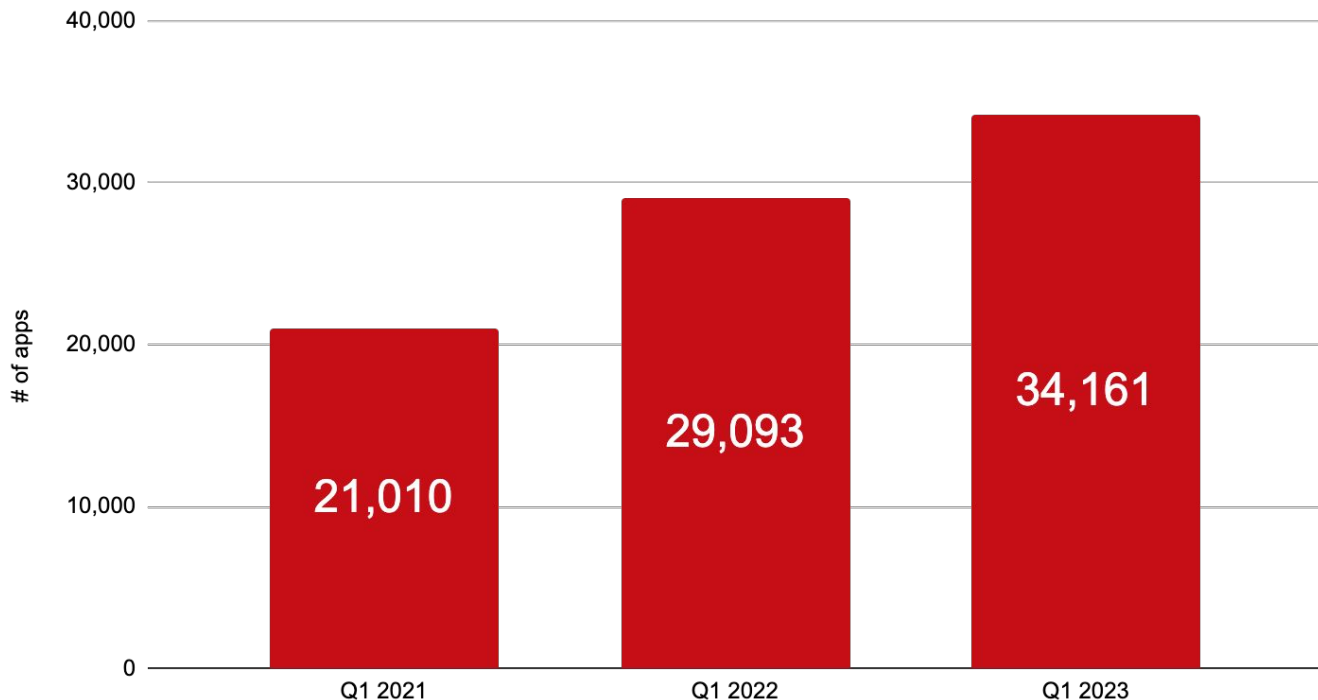


# 63%

increase over 2 years for the number of all apps in the Roku Channel Store, according to Pixalate's data.

## +17% YoY FOR TOTAL APPS IN THE ROKU STORE

# of total apps in Roku Channel Store; indexed against Q121; as measured by Pixalate





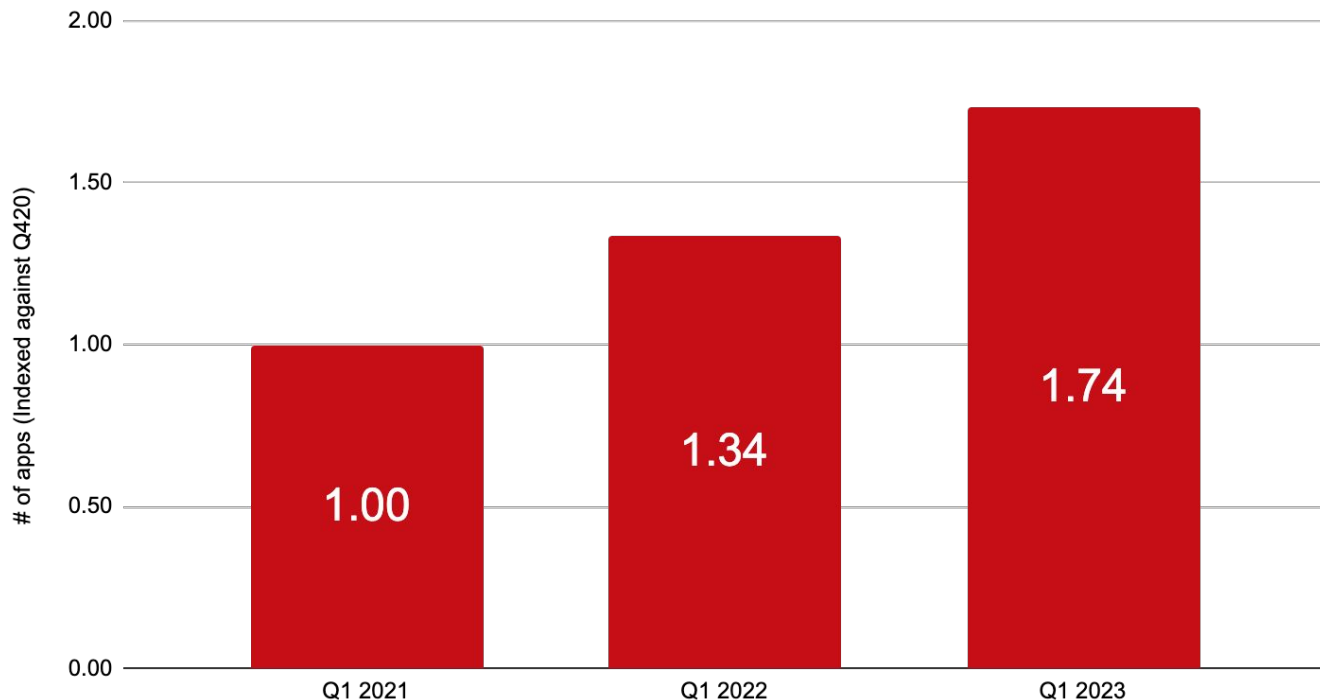
# 74%

growth over 2 years in the number of apps in the Roku Channel Store that support open programmatic advertising\*, according to Pixalate's data.

*\* minimum 50 invalid traffic-free ads sold per quarter, as measured by Pixalate*

## 30% JUMP IN ROKU CHANNEL STORE APPS W/ PROGRAMMATIC

# of total apps in Roku Channel Store w/ open programmatic ads (>= 50 IVT-free ads sold) ; indexed against Q121; as measured by Pixalate







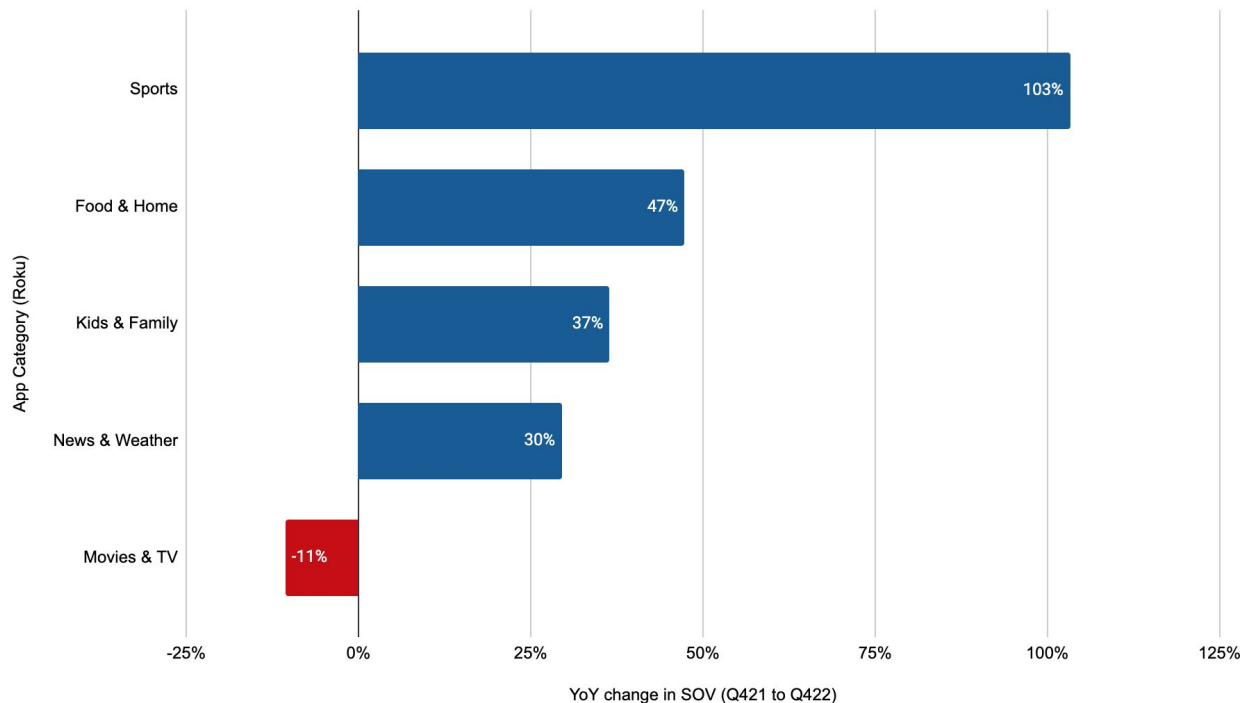
# +37%

Kids & Family apps on Roku saw a significant YoY bump in open programmatic ad market share, according to Pixalate's data.

*Top 5 Roku app categories with the highest Share of Voice of open programmatic CTV ads in Q221 are shown.*

## SPORTS CHANNELS ON ROKU SEE AD REVENUE RISE BY 103%

% change in SOV of ad spend by Roku app category, Q122 vs. Q123; open programmatic ads sold proxied for ad spend; as measured by Pixalate

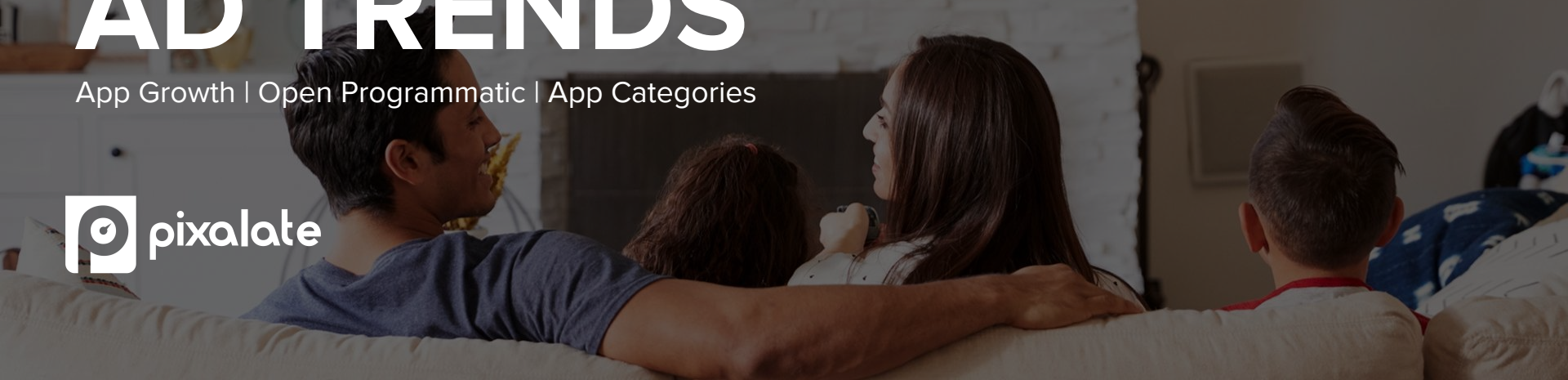
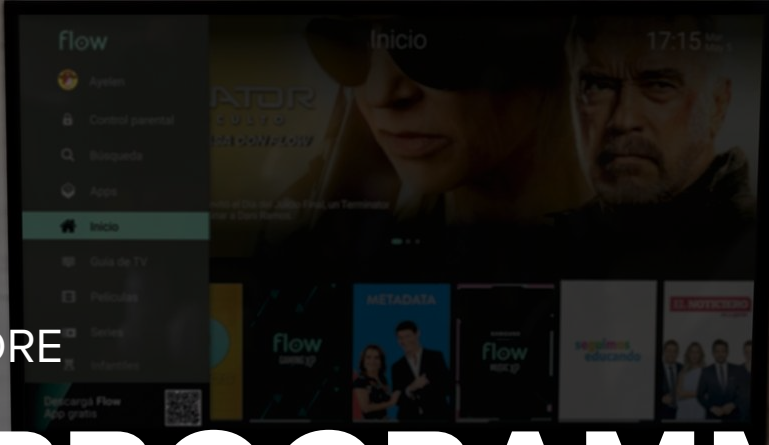




AMAZON FIRE TV STORE

# OPEN PROGRAMMING AD TRENDS

App Growth | Open Programmatic | App Categories



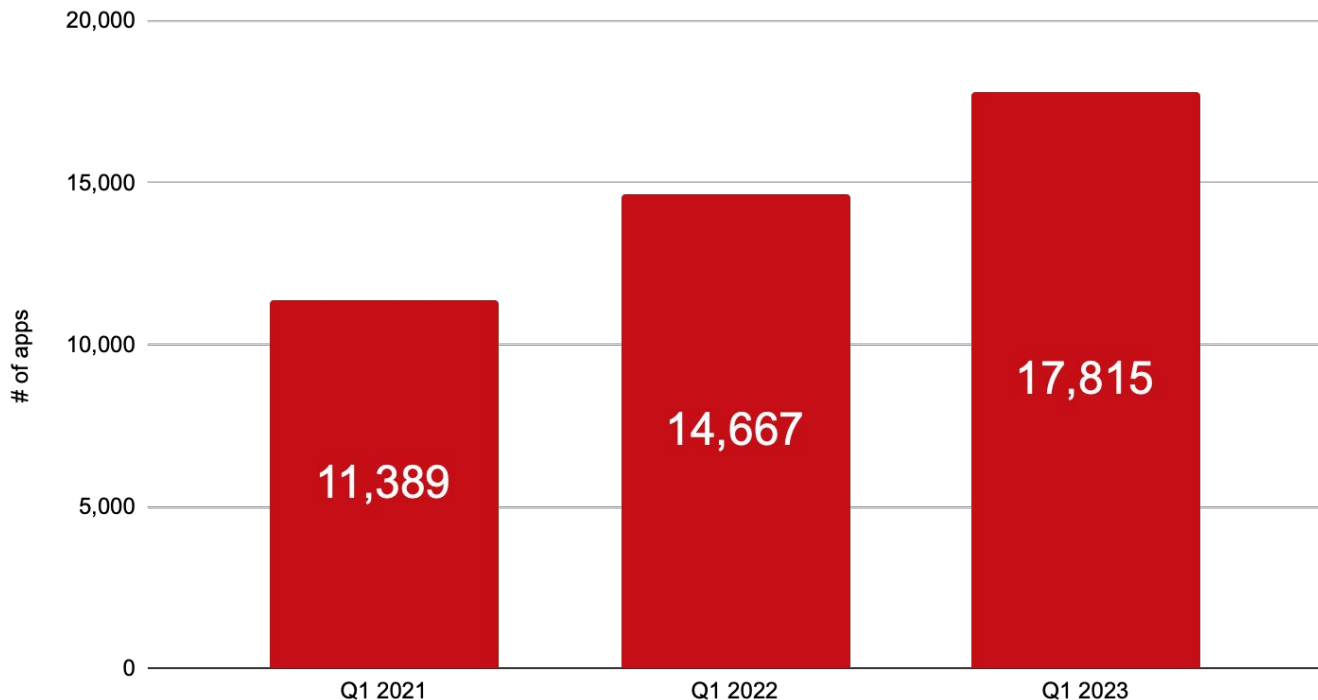


# 56%

increase over 2 years in the number of all apps in the Amazon Fire TV Channel Store, according to Pivalate's data.

## +21% YoY FOR TOTAL APPS IN THE ROKU STORE

# of total apps in Amazon Fire TV Channel Store; indexed against Q121; as measured by Pivalate





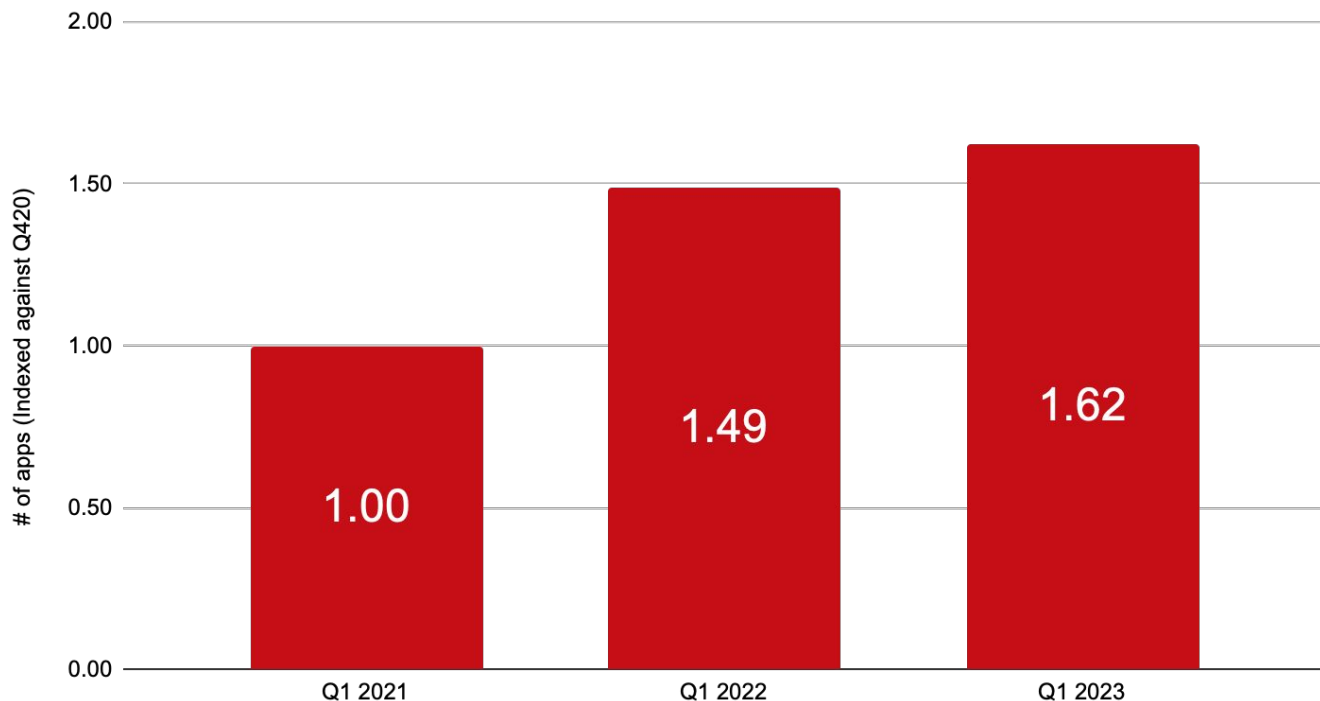
# 62%

increase over 2 years in the number of apps in the Amazon Fire TV Channel Store that support open programmatic advertising\*, according to Pixalate's data.

*\* minimum 50 invalid traffic-free ads sold per quarter, as measured by Pixalate*

## 9% RISE IN AMAZON FIRE TV STORE APPS W/ PROGRAMMATIC

# of total apps in Amazon Fire TV Channel Store w/ open programmatic ads (>= 50 IVT-free ads sold); indexed against Q121; as measured by Pixalate





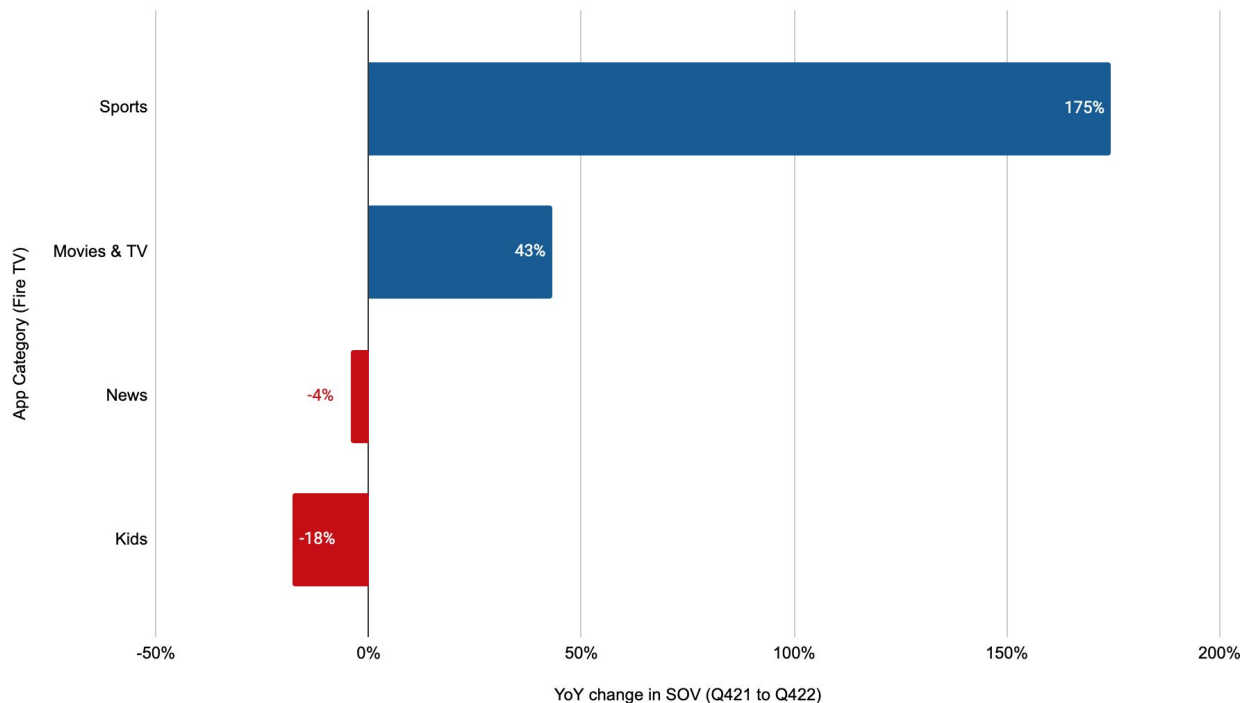
# 43%

YoY market share rise for the apps in the Movies & TV category on Amazon Fire TV, according to Pixalate's data.

*Top 4 Fire TV app categories with the highest Share of Voice of open programmatic CTV ads in Q221 are shown.*

## SPORTS CHANNELS RISE 175% ON AMAZON FIRE TV

% change in SOV of ad spend by Fire TV app category, Q122 vs. Q123; open programmatic ads sold proxied for ad spend; as measured by Pixalate





A woman with long dark hair, wearing a white top, is sitting on a couch and smiling as she looks at a tablet. A young child with dark hair, wearing a blue sweater, is sitting next to her, also smiling and looking at the tablet. The background is a plain, light-colored wall. The overall scene is warm and intimate.

CTV OPERATING SYSTEMS

# AD SPEND TRENDS BY OS

Roku | Android | tvOS | Tizen | Windows | Linux | SONY

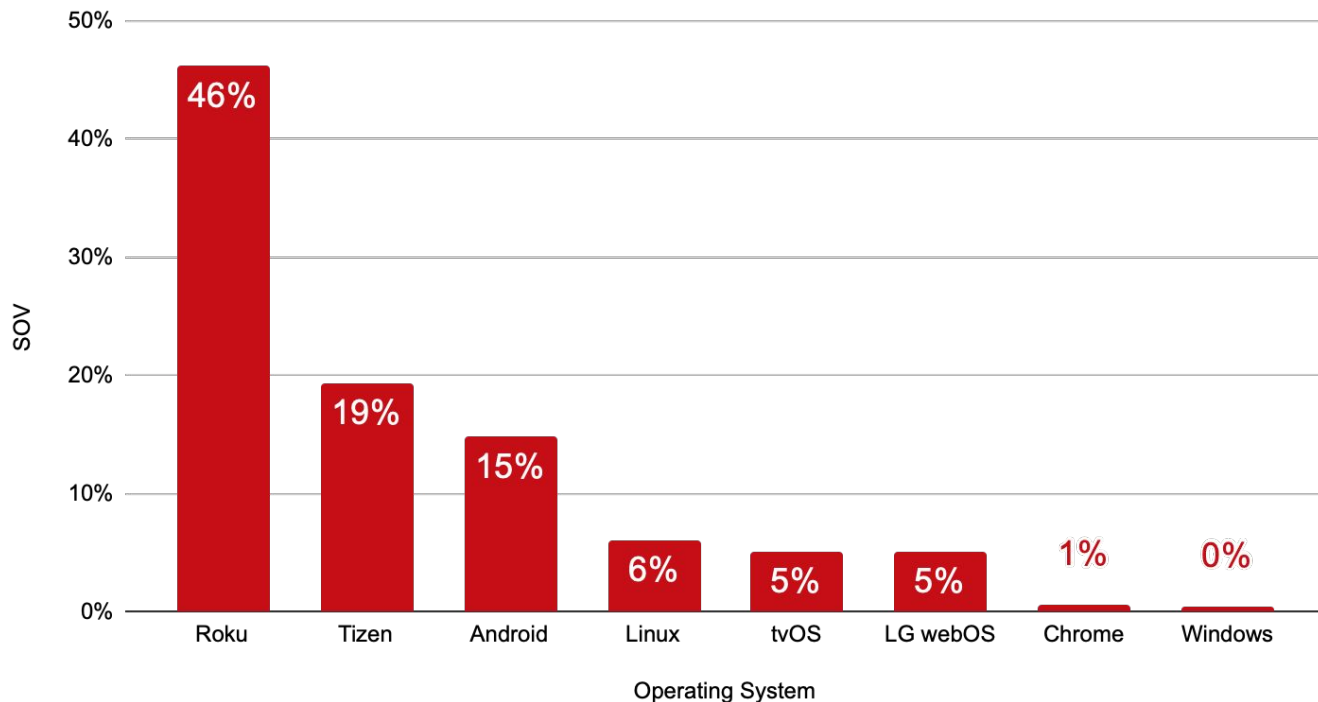


# 6%

Linux checked in at No. 4 in terms of OS market share (6%) in Q1 2023, according to Pixalate's data, followed by Apple's tvOS (5%) and LG's webOS (5%).

## ANDROID (15%) TAKES COMMANDING LEAD OF THIRD IN OS RACE

Share of voice of open programmatic ads sold by operating system; global; Q123; as measured by Pixalate



tvOS

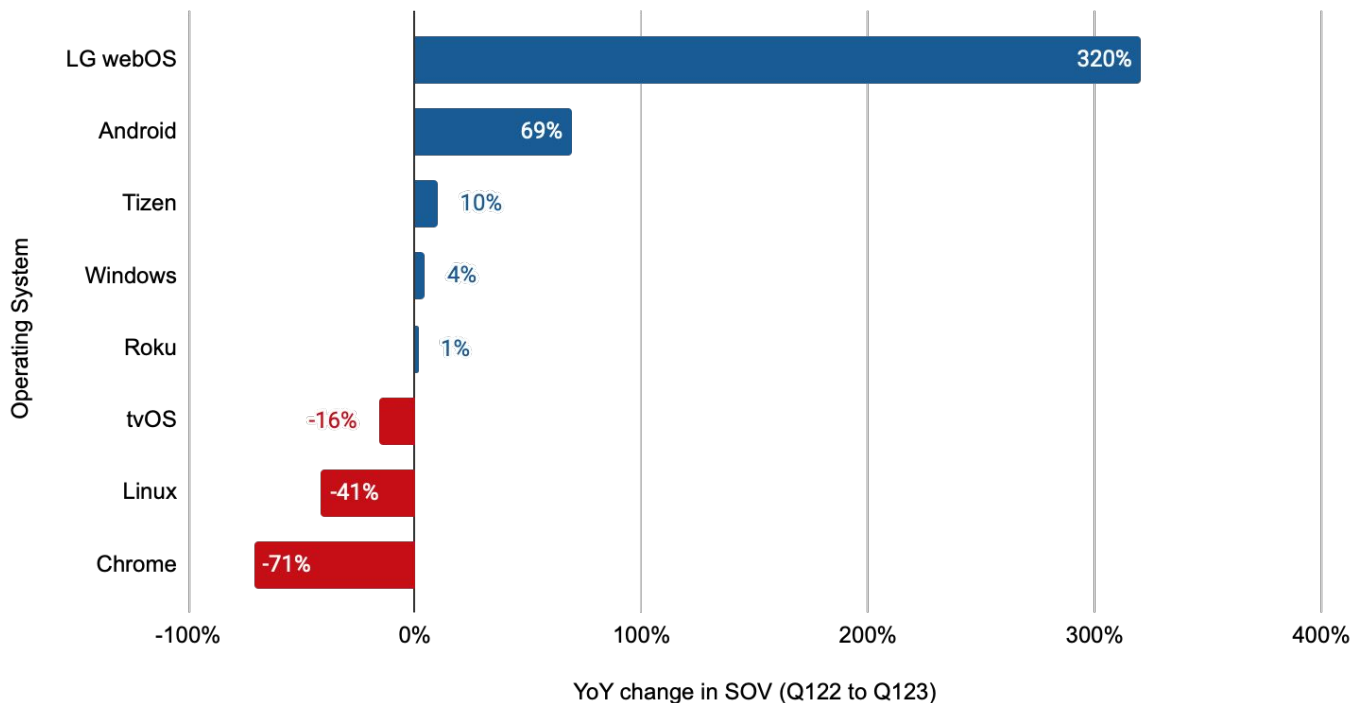


# +69%

YoY open programmatic CTV ad market share gain for Android, according to Pixalate's data.

## LG CONTINUES RAPID GROWTH WITH +320% MARKET SHARE GAIN

% change in SOV of open programmatic CTV ads sold from Q122 to Q123 by operating system; global; as measured by Pixalate





# METHODOLOGY, DISCLAIMER & GLOSSARY

# METHODOLOGY

Pixalate's data science team analyzed programmatic advertising activity across over 300 million Connected TV ("CTV") devices to compile this research. The research contained herein represents data collected by Pixalate from January 1, 2020 through March 31, 2023.

In the context of this report, programmatic ad transactions, as measured by Pixalate, are proxied for ad spend. The report examines global programmatic advertising activity. Pixalate's datasets — which are used exclusively to derive these insights — consist predominantly of buy-side open auction programmatic traffic sources. Pixalate monitors over 300 million CTV devices and billions of CTV programmatic advertising impressions.



# DISCLAIMER

The content of this report reflects Pixalate's opinions with respect to the factors that Pixalate believes can be useful to the digital media industry. Any data shared is grounded in Pixalate's proprietary technology and analytics, which Pixalate is continuously evaluating and updating. Any references to outside sources should not be construed as endorsements. Pixalate's opinions are just that, opinions, which means that they are neither facts nor guarantees.

Pixalate is sharing this data not to impugn the standing or reputation of any entity, person or app, but, instead, to report findings and trends pertaining to programmatic advertising activity across CTV apps in the time period studied. Pixalate does not independently verify third-party information.

Per the [Media Rating Council \(MRC\)](#), "Invalid Traffic' is defined generally as traffic that does not meet certain ad serving quality or completeness criteria, or otherwise does not represent legitimate ad traffic that should be included in measurement counts. Among the reasons why ad traffic may be deemed invalid is it is a result of non-human traffic (spiders, bots, etc.), or activity designed to produce fraudulent traffic." Certain IVT is also sometimes referred to as "ad fraud." Per the [MRC](#), "Fraud' is not intended to represent fraud as defined in various laws, statutes and ordinances or as conventionally used in U.S. Court or other legal proceedings, but rather a custom definition strictly for advertising measurement purposes.

# GLOSSARY

**Ad market share / share of voice (SOV):** Based the proportion of sold programmatic ads that go to a certain device, operating system, category, etc. For example, if Device X received 20 of 100 total ads one quarter, its market share would be 20%. If Device X then received 36 of 120 total ads the next quarter, its market share would have increased by 50% (from 20% to 30%).

**Ad spend:** In the context of this report, programmatic ads sold, as measured by Picalate, are used as a proxy for ad spend.

**Apps:** An app is also sometimes called a “channel” when discussing CTV advertising. This report uses the term “app” for consistency. “Apps with programmatic ads” are based off app Bundle IDs in the ecosystem across all CTV app stores.

**Connected TV/OTT:** Also referred to as “CTV” in this report. Picalate defines CTV based on the device being used by the end-user. Examples of CTV devices include Apple TV, Roku, Chromecast, Amazon Fire TV, Smart TVs, and gaming platforms.

**Household adoption:** The estimated percentage of U.S. households reachable via programmatic CTV advertising, using the total number of U.S.-based IP addresses as a baseline and removing invalid traffic (IVT), as measured by Picalate.

**Programmatic CTV:** The report examines global programmatic advertising activity across CTV devices. Picalate’s datasets consist predominantly of open auction programmatic traffic sources.

# ABOUT PIXALATE

Pixalate is the market-leading fraud protection, privacy, and compliance analytics platform for Connected TV (CTV) and Mobile Advertising. We work 24/7 to guard your reputation and grow your media value. Pixalate offers the only system of coordinated solutions across display, app, video, and CTV for better detection and elimination of ad fraud. Pixalate is an MRC-accredited service for the detection and filtration of sophisticated invalid traffic (SIVT) across desktop and mobile web, mobile in-app, and CTV advertising. [www.pixalate.com](http://www.pixalate.com)



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