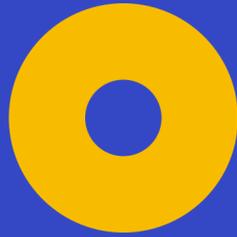# 2021

State of Visual Media

Read the Full Report →

Cloudinary

The Path to Better Connections is a Visual One.

Welcome to Cloudinary's 2021 State of Visual Media report.

For our third annual report, we analyzed data across more than 670 global customer brands to gain insights into how visual media content is produced, managed, viewed, and consumed.

Spanning 10 vertical industries with a representative sampling of more than 80 billion transactions per month, the data we analyzed for this year's report emphasizes the degree to which the visual economy is impacting brands and the way they engage and connect with audiences. With visuals at the center of this new world of digital-first engagement, or what we call visual-first engagement, most brands upload new image and video assets every day, from dozens to thousands. One of our largest retail customers saw its visual content bandwidth increase by 129% from 2019 to 2020, and is on track to see another massive increase in 2021. In March 2021 alone, Cloudinary managed and delivered an average of 2.4 million image and video assets per customer.

By tapping into this treasure trove of data, produced by some of the world's most popular brands, we've identified several key trends in visual engagement, including trends shaped by the pandemic and our increased reliance on digital forms of communication and connection. We also take a look at what's needed to raise the bar on these visual-first experiences as we return to a post-pandemic world — a world in which fast and flawless visual content will remain critically important across all facets of our lives.

So dig in and let us know what you think.

Benji Azaria
Director of Data Science, Cloudinary

2021 State of Visual Media

Key Findings

In uncertain times, brands need the ability to upscale *and* downscale.

During the pandemic, industries such as e-learning, e-commerce and food delivery saw their site traffic more than double. The travel sector, by comparison, had to fight troughs of deflation where video traffic plummeted to 1-5% of pre-pandemic image use levels.

Chapter 1: Covid Impact →

It's time to harness automation and embrace AI.

Brands used automated transformations extensively to shine in today's visual economy, with the top five transformations related to: resizing, quality selection, format selection, cropping or device pixel ratio. More advanced transformations and AI-based add-ons are most commonly used by the industries that need them most, like media and publishing, and are still making their way into mainstream adoption.

Chapter 2: Visual Mastery →

Brands are using a wide variety of image formats.

Most companies use three (32.5%) or four (28.6%) different image formats. JPEG (95%) and PNG (73%) are still the leading image formats, but WebP (69%) is catching up quickly. The recent introduction of Google's Core Web Vitals likely had an influence over this behavior. Other modern formats, such as JP2 (25%) or HEIC (2%), are also being adopted slowly but steadily.

Chapter 3: Image Formats →

Video traffic grew significantly during the pandemic.

Video views nearly doubled and video bandwidth grew almost 140% in Q2 2020, when the pandemic first began. We also see more creative and novel use cases, such as videos delivered to Internet of Things (IoT) devices. Not surprisingly, both the number of video assets as well as the number of times brands are transforming their videos are increasing greatly.

Chapter 4: Video Demand →

Mobile-first responsiveness is a must.

Most companies within our data set have made strides when it comes to mobile responsiveness and are on top of this trend. Between December 2019 and April 2021, mobile devices generated 51.4% of traffic, with significant regional differences worth noting. India, the UK, Germany and the U.S. represented a range of traffic bandwidth, from 48% to 81%.

Chapter 5: Responsive Design →

Brands must prepare images and videos for microbrowsers.

Many of the links people share today are viewed on 'dark social' channels, private messaging apps growing in popularity every day. The microbrowsers that generated the most traffic for our customers globally include iMessage, WhatsApp, Facebook Messenger, Slack and Snapchat, in that order. In the media industry, Facebook Messenger is the clear number-one platform for sharing images and videos, confirming the important role Facebook continues to play for news distribution.

Chapter 6: Microbrowsers →

Cloudinary

Picturing the Impact
of the Pandemic

During 2020, the power of visual content had new meaning.

Images and videos kept us connected and engaged in new ways — at work, at school and at home. Videos in particular provided a gateway to a world outside our locked down realties. Not surprisingly, image and video requests on Cloudinary's platform increased significantly. From January 2019 to December 2020, video related traffic on Cloudinary had nearly doubled to 12.79% of total traffic, and the average percentage of monthly bandwidth for video rose from 18.97% to 26.74%.

However, these figures vary significantly by industry, and we can directly correlate the volume of visual media requests to that industry's health. Some saw "epic scale" growth where others experienced significant deflation. For example, in e-learning, the average number of video requests grew dramatically; for some major players, this figure doubled. Perhaps unsurprisingly, e-commerce brands' use of video grew substantially. Whereas before the pandemic, about 30% of our e-commerce customers used videos, now it's at more than 50%.

The food delivery industry, which also flourished during COVID-19 lockdowns, also ramped up its use of visual media. Major players' requests for videos and images more than doubled during the first lockdown, then decreased slightly afterwards, but remains higher today than before the pandemic.

Video Bandwidth and Traffic

Pre-Pandemic   December 2020

18.97% → **BANDWIDTH** → **26.74%**

6.8% → **TRAFFIC** → **12.9%**

By Industry

E-LEARNING   E-COMMERCE   FOOD DELIVERY
↑**2x**   ↑**20%**   ↑**2x**

Cloudinary

2021 State of Visual Media

In harsh contrast, the travel industry – for obvious reasons – saw dramatic downward trends since the start of the pandemic. Until March 2020, the median percentage of video bandwidth in this industry was quite high with peaks of 23%. The video bandwidth plummeted to between 1% and 5% during the whole of 2020 until March 2021.

UP TO **23%**

TRAVEL
Video bandwith

1–5%

These traffic troughs are a challenge. Many CDN providers base their fixed monthly fees on peak viewing bandwidth usage. As a result, the monthly fees increase the more often an image or video is viewed. If companies have significantly fewer visitors during off-season times or experience dips in traffic during a crisis like the pandemic, their monthly fee stays the same. A fairer approach is to charge a flat fee according to the size (in bytes) of the resource, as this also reduces the cost when there is less traffic on a website.

When traffic peaks occur, maintaining site performance is the primary challenge, along with avoiding slow loading times, and ensuring a high-quality user experience. This becomes especially important with Google's Core Web Vitals directly impacting search rankings. Without a tool to automatically optimize images and videos, and guarantee bandwidth and image quality are well balanced, meeting all of these requirements is almost impossible. **More information on what you need to consider can be found in the next two chapters.**

Pro tip

Beyond downscaling and upscaling, adopting a multi-CDN approach is critical when it comes to protecting your site against outages, internet breakdowns and inevitable traffic spikes and demands.

Cloudinary

2021 State of Visual Media

USE CASE

◎VELTRA

VELTRA, Japan's leading online travel experience marketplace, adopted Cloudinary's advanced image optimization technology, delivered as an Amazon CloudFront service from the Amazon cloud, to enable maximum flexibility and greater efficiency to on-going COVID travel sector disruption. As a result, VELTRA—a play on the word TRAVEL—is now set up to deal with whatever the market demands from it in the next phase of post-pandemic leisure experiences.

Read the case study ◱

"
Cloudinary also has a fixed monthly fee, but with Amazon CloudFront, the CDN is fully charged on a pay-as-you-go basis, which we benefit from because it reduces the cost when there is less traffic on our website. We found Cloudinary's service to be a good fit in terms of cost, as well as its many image management functions.

Naoyuki Matsuo
Vice President of Technology Service Planning and Technology
VELTRA

○ Cloudinary

Visual Mastery to Move Beyond the Basics

The modern visual workflow involved with routinely uploading images and videos requires an entirely new set of skills.

Our data suggests most brands fully embrace the most established visual transformations and automations, but are still making their way toward adopting more advanced capabilities. Today's content and user experience teams need to continue developing their visual mastery to transform images and videos so that they can break through the visual cacophony without sacrificing load times and bandwidth constraints.

Fortunately, most customer brands that use images heavily are saving time and developer resources by automating the most routine transformations. A full 99% of the brands in our study are performing basic resizing to maintain the width-to-height aspect ratio, even when, for example, a 9:16 photo needs to be displayed as 1:1 square in the Facebook feed.

Most brands today fully understand the need to strike the optimal balance between file size and quality (75%) and rely on automatic format selections to ensure the best format is delivered (69%). Cropping transformations, which automatically remove parts of an image to either fit it into a required aspect ratio or to highlight a specific image area, are also incredibly popular and leveraged by most of the companies analyzed (63%).

Top 5 Media Manipulations

99% DYNAMIC RESIZING

75% AUTOMATIC QUALITY COMPRESSION

69% AUTOMATIC FORMAT SELECTION

40% AUTOMATIC RESPONSIVE DELIVERY

17% INTELLIGENT CROPPING

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2021 State of Visual Media

Not surprisingly, a high number of media properties (56%) are harnessing the power of more advanced transformations, like intelligent cropping where detected faces are optimally positioned within an image crop.

Although we see huge untapped potential for brands to gain better business and financial outcomes by raising their visual mastery, we aren't too surprised advanced capabilities are slow to be adopted. Brands are managing huge volumes of new content every day, and nailing the basics is a critical first step to success. Once that foundation is in place, expanding one's visual engagement toolkit is a natural next step. For inspiration look to digitally native companies that were born on the web, like Cloudinary's customer MADE.COM.

Pro tip

Embrace advanced AI-enabled visual transformations like autotagging, background removal, and intelligent cropping to take your website from good to great and stand out in today's visual economy.

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2021 State of Visual Media

Cloudinary

USE CASE

MADE⊕

Rooted in the belief that great design should be available to everyone, MADE.COM firmly understands that its customer journey has to recreate as much of the physical experience as possible online. As a leading digital lifestyle brand for home goods with experiential showrooms across seven locations globally, the customer experience (CX) users get from its desktop and mobile online presence must be of the absolute highest standards, like its carefully chosen makers and materials. This bar has been met through a recent site rebuild with Cloudinary's technology, guaranteeing the kind of engaging visual experiences MADE's shoppers have come to love.

Read the case study ⧉

> We needed to make sure the products were the hero, because it is product imagery that is ultimately going to sell these products online. We needed bigger, sharper images that really give you the detail of the texture of the velvets and the other fabrics we use. We also wanted the option to edit the images so we could easily change background colors. Grey backgrounds help frame product images while adding shadows gives depth. But we didn't want to add such background effects to the images themselves to ensure they'd be future-proof for any brand design updates.

Spencer Wong
Head of Digital Experience
MADE.COM

Modern Web,
Modern Formats

Today's visual economy comes with a wide variety of available image formats, with most brands relying on three or four different image formats to tell their stories.
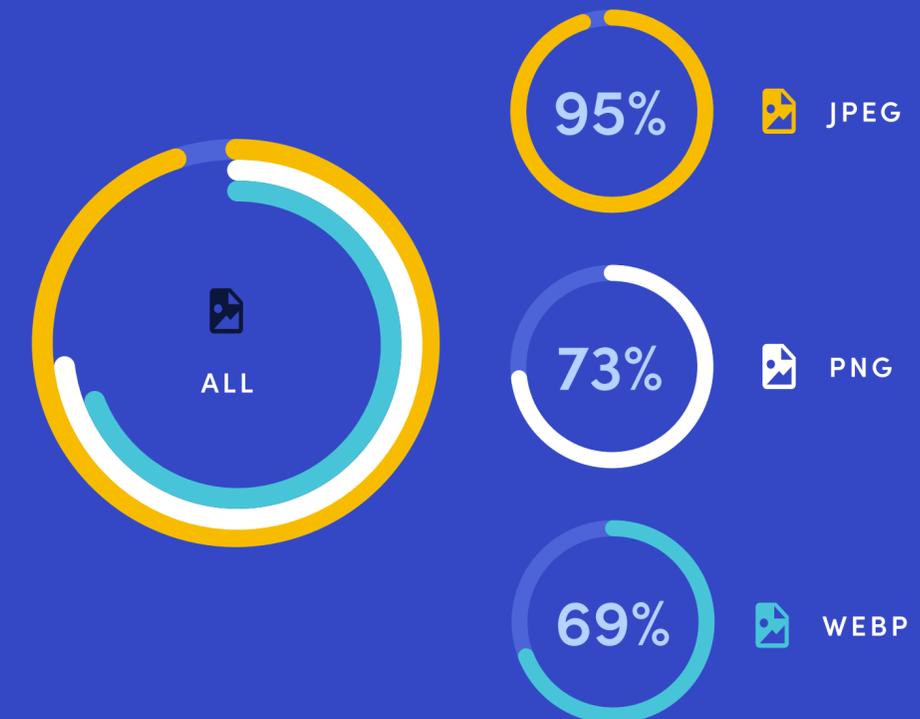
According to our data, in October 2019 60% of our customers used three or more formats and by March 2021 that number had risen to 71%.

More established formats like JPEG date back to the 1990s but newer, more lightweight formats like WebP have emerged in the last decade. It's no surprise that JPEG – the lowest common denominator that displays well on all types of browsers and devices – remains the most frequently used image format (95%). PNG ranks second with 73%, and WebP with 69% is close behind in third place. Our data also shows that WebP adoption has grown since 2019 and is on track to overtake PNG. This development could be as a result of Safari adopting WebP in macOS Big Sur and iOS 14.

WebP's momentum comes as little surprise when you consider the following data: the average WebP file is roughly 20% smaller than the size of the average JPEG. Another more lightweight format that grew in adoption was JPEG 2000, with an average size that sits in the middle of WebP and JPEG. In October 2019, just 4.5% of brands used the JPEG 2000 format and in March 2021 usage exploded to 25% - an increase of more than 450%.

Top 3 Formats
Usage rate from October 2019

ALL

95% JPEG

73% PNG

69% WEBP

Cloudinary

2021 State of Visual Media

The adoption rate of JPEG XR – also known as WDP, developed by Microsoft – went the opposite way: from 33% in October 2019 to 6% in March 2021. And newer formats like HEIC and AVIF still have very low adoption rates, though HEIC saw a noticeable increase from 0.2% in October 2019 to 2.1% in March 2021 with our customers.

One reason lightweight formats may have grown in popularity in 2020 might be companies' preparations for the June 2021 launch of Google's Core Web Vitals. These three metrics measure web performance and give search result priority to sites that prioritize the user experience. The first metric, Largest Contentful Paint (LCP), refers to how long the largest object on a site (usually an image) takes to load before a site visitor can see it completely. Google recommends keeping the LCP under 2.5 seconds. Data from the 2020 Web Almanac revealed that more than 47% of desktop and 57% of mobile websites must improve their LCP to meet Google's criteria. The increase in WebP and JPEG 2000 usage in the second half of 2020 and the first quarter of 2021 suggests that companies have heard and acted on these search-affecting warnings.

With Core Web Vitals impacting search rank, we will likely see more companies interested in replacing JPEG where possible. The new JPEG XL format, based on Google's PIK codec and Cloudinary's Free Universal Image Format (FUIF) codec, is a promising candidate here. JPEG XL can not only reduce file size by 50%, but it is also the first "JPEG-replacement" candidate with a plausible transition path.

Other codecs
Usage rate from October 2019

JPEG 2000
⬆ 450% +   4.5%   25%

JPEG XR
33%
⬇ 27%   6%

HEIC
⬆ 950%   .2%   2.1%

The new kid on the block

JPEG XL is a royalty-free raster-graphics file format that supports both lossy and lossless compression.

The format targets the capture, storage, archival, transmission, and distribution of photographic images, as well as graphics, illustrations, mixed contents (e.g. screenshots) and animations.

✓ Responsive web
✓ Wide colour gamut
✓ High Dynamic Range (HDR)
✓ Legacy transition features
✓ Effective compression at high visual quality

> As roughly 60% of most of today's website data is taken up by images, cutting file size in half from the current JPEG standard to JPEG XL could reduce bandwidth requirements by up to 25-30%.

Dr. Jon Sneyers
Senior Image Researcher at Cloudinary and Co-chair of the JPEG XL Community

See how JPEG XL compares to other image codecs in the Battle of Codecs.

Get the graphic ⧉

Cloudinary

The Continued Rise of Video

No doubt video remains a critical medium for visual storytelling.

From January 2019 and through the pandemic, video requests on our platform doubled from 6.8% to 12.79%, and video bandwidth grew by more than 140% in Q2 2020. And while managing video is far more complex than managing images, there are fewer video demand than image codecs to handle.
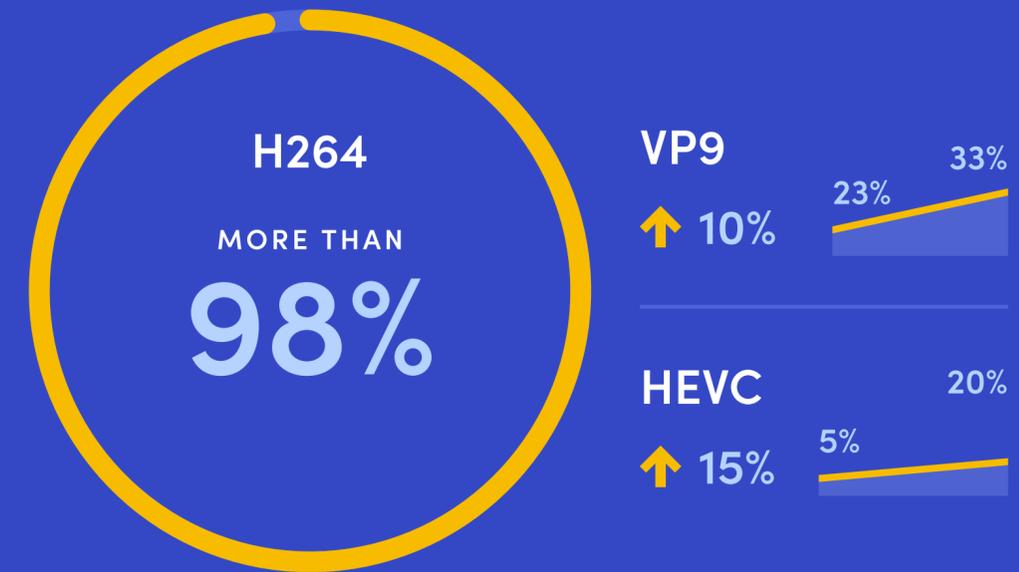
Among the brands in our study, the h264 video codec is the clear winner with an adoption rate of more than 98%. However, other formats are slowly gaining momentum. For example, 23% of brands used the VP9 format in October 2019 and this grew to nearly 33% by March 2021. Over the same time period, the newer HEVC codec increased from 5% to 20%.

We also looked at differences between mobile versus desktop delivery. Our data showed that the h264 (21%) and HEVC (20%) formats are delivered much more often to mobile web browsers than VP9 files, which are mainly delivered to desktop browsers (29%).

VP9

H264
HEVC

Video codec adoption rates
Usage rate from October 2019

H264

MORE THAN

98%

VP9

↑ **10%**

23%   33%

HEVC

↑ **15%**

5%   20%

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2021 State of Visual Media

No doubt managing video codecs can be complex. But that's not stopping brands from managing and transforming more video content than ever before. Our heaviest video users are transforming their video assets 17 times on average, not too far behind our heaviest image users which transform their images 20 times on average. See Chapter 5 for more.

Brands should consider how AI is making it much easier to transform and manage video at scale, such as:

View video

Shoppable videos for e-Commerce that bring products to life and link shoppers to the relevant product pages where they can make purchases.
Learn more ↗

View video

3D videos that allow brands to generate 360-degree animated images from a 3D model; generate a 360-degree video from a 3D model; or generate a single, stand-alone image from a 3D model.
Learn more ↗

Video is absolutely everywhere, even in places where you might not expect to see it. As an example, Vorwerk uses Cloudinary to deliver short videos directly to the user interface of its Thermomix kitchen appliance. This requires special codecs, as video generates a lot of data that is compressed before delivery.

Meet the codec

Lean and powerful — The open, royalty-free video codec AV1 was specifically designed for Internet video transmissions.

✓ **More than 100 coding tools give more options to improve performance**

✓ **Same visual quality as VP9 codec with at least 30% bitrate savings**

AV1

Cloudinary
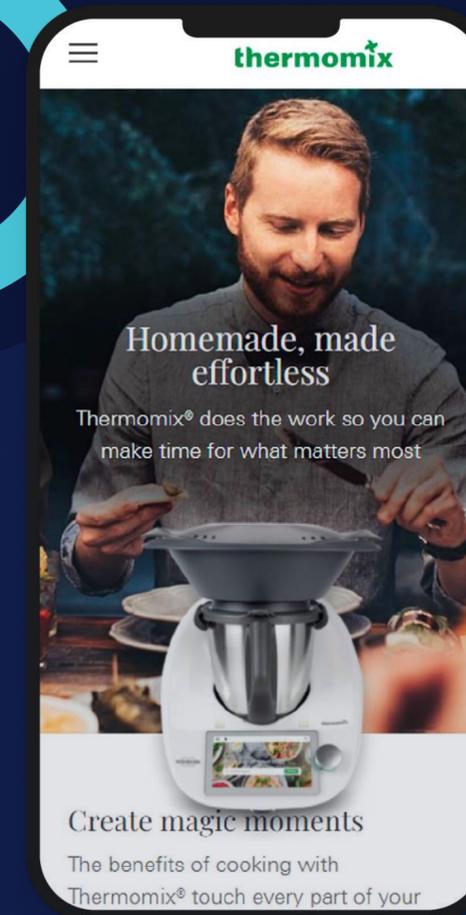
2021 State
of Visual Media

USE CASE

VORWERK

Vorwerk relies on Cloudinary to manage and deliver high-quality images and videos quickly and flawlessly to millions of Thermomix® customers using its "Cookidoo®" recipe platform. Hosting more than 66,000 digital recipes, Cookidoo® is available not only through the web and mobile applications, but also through the new generation of Thermomix® smart kitchen appliances TM6, bringing the Internet of Things (IoT) to life in the kitchen. With Cloudinary's media experience platform, Vorwerk can deliver on its quality promise through compelling visual assets and a seamless global brand experience.

Read the case study ⬀

> Cloudinary allowed Vorwerk to deliver image and video content fast, without interruptions, in all served markets, on all its devices, including the Thermomix® IoT-appliances.
>
> **Sebastian Röhren**
> Senior Solution Architect Digital R&D
> VORWERK
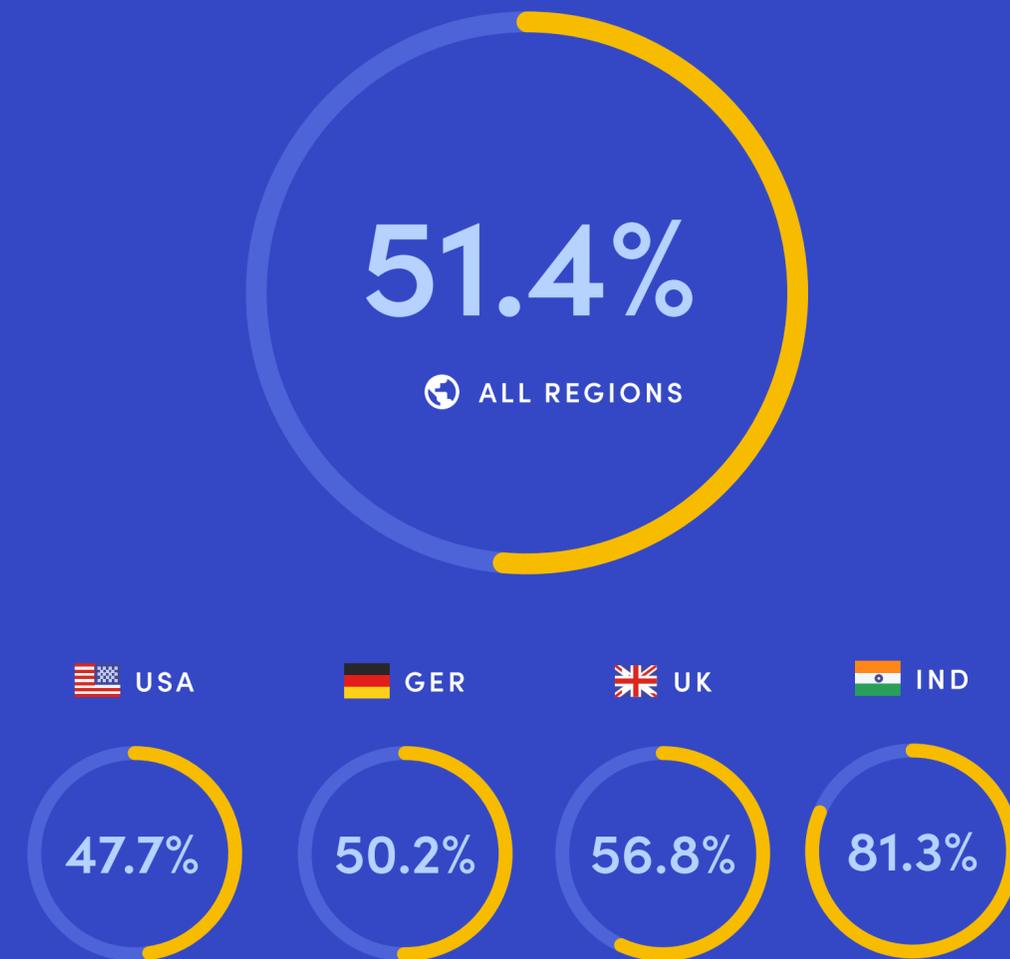

Cloudinary

Activate the Benefits of Responsive Design

According to April 2021 data from Statista, mobile accounts for approximately half of web traffic worldwide.

This trend is confirmed by our usage data as well. During 2020, mobile devices generated 51.4% of traffic, with significant regional differences: in the US, mobile accounted for 47.7%, in Germany 50.2%, in the UK 56.8% and in India 81.3%.

This means that companies need to ensure all images and videos are responsive and optimized for mobile devices. Historically, this meant content teams needed to store multiple versions of every image and video to appear correctly in different viewing windows, including landscape and portrait orientations. Given that most brands now upload images every day, this is a difficult task. It's not just about delivering responsive images and videos but also about delivering them at scale.

It's little wonder then that almost 40% of the brands in our study use automated responsive transformations to deliver their images and videos. However, we see significant differences by industry: food & drink (68.38%), e-commerce (67.38%) and education (67.26%) are clearly above average in their use of responsiveness; the automotive industry comes in last place at 38.28%
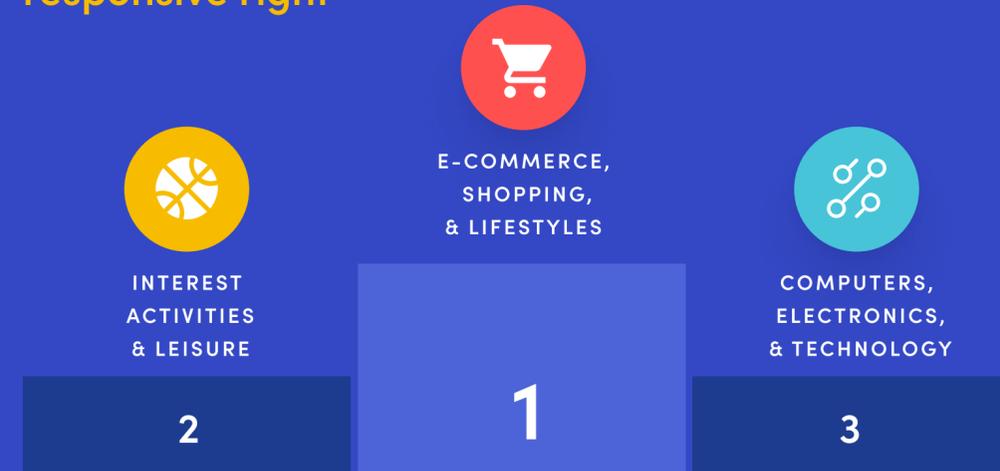
Mobile traffic by region

51.4%
🌐 ALL REGIONS

🇺🇸 USA **47.7%**

🇩🇪 GER **50.2%**

🇬🇧 UK **56.8%**

🇮🇳 IND **81.3%**

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2021 State of Visual Media

The industries getting responsive right

E-COMMERCE, SHOPPING, & LIFESTYLES

INTEREST ACTIVITIES & LEISURE

COMPUTERS, ELECTRONICS, & TECHNOLOGY

2

1

3

When comparing responsive design usage, it is applied more often to videos than images across all industries. Those not using responsive design for images are losing an opportunity to score highly for Google's Core Web Vitals, which are all about user experience. Given that half of the world's web traffic comes from mobile, images – not just videos – should also load perfectly well. Optimizing for responsiveness will not only please the almighty Google algorithm, but customers will appreciate it as well.

MX *matters*

EPISODE 08
Mediavine's CEO on what brands must know about Core Web Vitals

Watch the podcast ↗

Pro tip

Up your SEO game and boost customer experience in a mobile-first world by applying automated responsive design to optimize images and videos at scale.
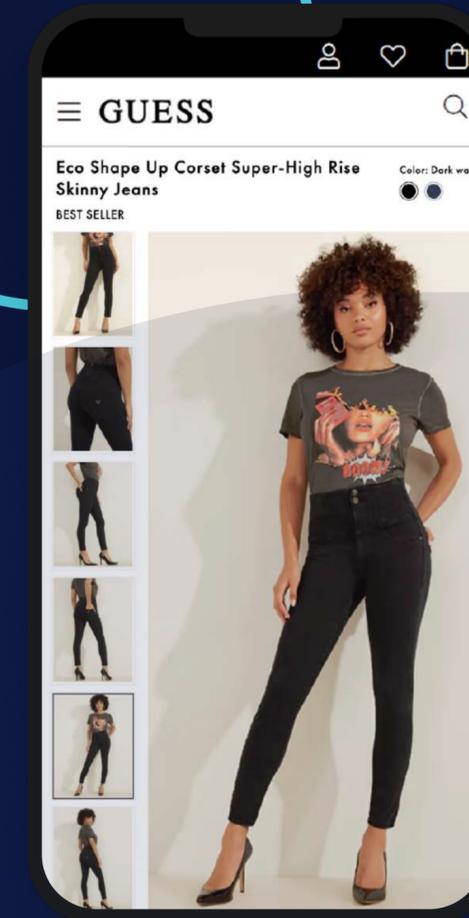
Cloudinary

USE CASE

GUESS

An antiquated image management system, incompatible with modern browsers and devices, was making it increasingly difficult for GUESS to deliver an exceptional user experience. The vast majority of customers (76%) look at products on smartphones, so when GUESS was redesigning its viewer, they wanted to deliver the best mobile experience possible. However, the company also had to take into consideration that many customers completed their purchase on the desktop. Cloudinary's auto-responsive Product Gallery provided GUESS the flexibility needed to deliver the same, high-quality user experience, regardless of device. With greater automation and continued technological innovation, Cloudinary has driven greater efficiency and organization in the workflow for the GUESS creative studio, merchandising team, and developers, while significantly improving performance for even the most image-rich pages.

Read the case study ⎘

> The ability to navigate the online store better, on both desktop and mobile, and view the products faster, either on the product listing or product detail pages, was a key component to the conversion improvements. Any improvement on the product detail page leads to a significant increase in conversions.

Sasha Mattison
Senior Front-end Developer and UX manager
GUESS

Cloudinary

Shine a Light on The Engagement Opportunities You Can't See

The increase in mobile traffic leads us to another important trend: the growing importance of content shared in messaging app browsers, or microbrowsers.
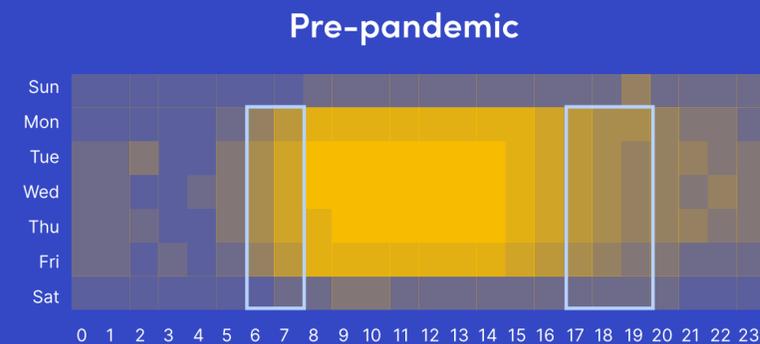
According to recent data from Spectrm, messaging apps have overtaken social media platforms in the number of active monthly users by 20%. This means the majority of content shared via mobile today is viewed on these so-called 'dark social' channels in the form of links pasted into emails, chat apps like WhatsApp and Messenger, and business collaboration tools like Slack.

The top instant messaging platform the brands in our study favor is iMessage. The service is the number one globally, except for in Southern Asia, Sub-Saharan Africa and Northern Africa, where WhatsApp leads. WhatsApp is the number-two service globally (in nine of 14 regions), followed by Facebook Messenger and Slack (in six regions each). Northern America is the only region where WhatsApp did not enter the top three.

People shared content around the clock during the pandemic.

Slack usage increase in the early mornings (6-7 am) and early evenings (5-7 pm) and on Saturdays

Pre-pandemic

December 2020

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of Visual Media
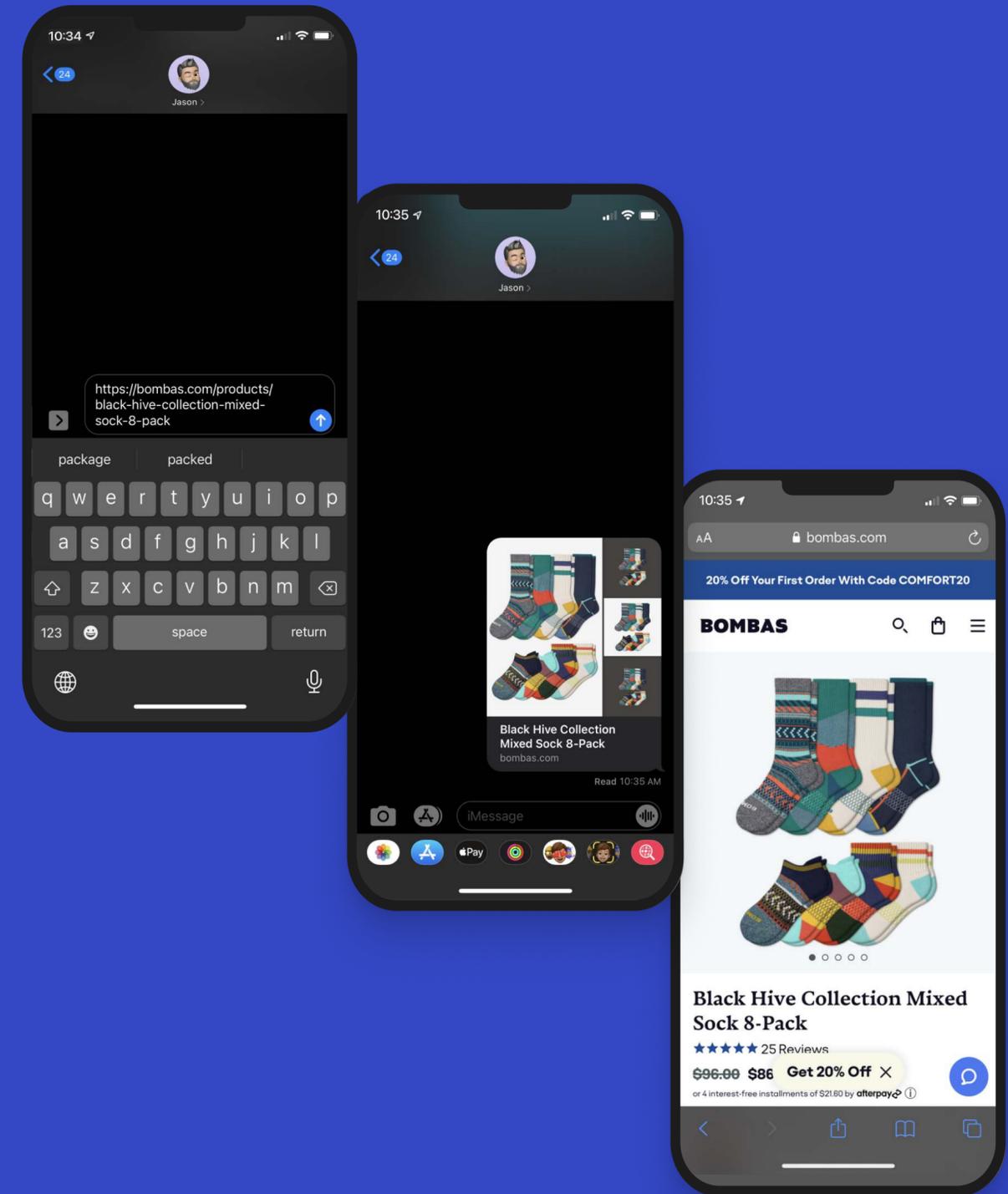
iMessage maintains its number-one position across sectors, except for the Media industry where Facebook Messenger is mostly used to share images and videos (75%), and Computer & Electronics where Slack is ranked first (73%). This confirms the important role Facebook plays for news distribution. Slack is the number-two service across all industries and Snapchat ranks three.

And new dark social channels exploded during the pandemic, including secure systems like Signal, along with chat windows in video conferencing software like Zoom and Teams. Even though these channels started as communication platforms, they've mimicked browsers over time, effectively functioning as microbrowsers without the coding required for developing real browsers.

We also found confirmation that people shared content around the clock during the pandemic, with normal life away from the home and with other people put on pause. We took a closer look at the usage times and compared them with the pre-COVID data. We found a slight Slack usage increase in the early mornings (6:00 to 7:00 a.m. local time) and early evenings (5:00 to 7:00 p.m.) and on Saturdays (five hours during COVID versus one hour pre-COVID).

In our visual economy, it is important to address the unique needs of specific dark social channels. Why? Because each link shared within these microbrowsers "unfurl" differently, which means they create different previews based on the particular microbrowser. Brands can do a good amount of optimizing to tailor these images and videos to attract link clicks. The first step is to identify which microbrowsers are popular among a customer base and in a given industry, and then optimize (see Tips & Tricks) links accordingly. No keyword-search results, banner ads or newsletter will be trusted by a customer more than links shared by family, friends, and colleagues. Optimize those links accordingly, and a brand will shine through in the visual economy.

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Microbrowser tips and tricks

Annotate everything.

Upgrade the HTML markups on all your pages with microdata: titles, descriptions, images for links. Limit the title length to 10 words and descriptions to 240 characters each. And to avoid confusion, annotate only one favicon.

Post unfurl images.

Spotlight your content with a compelling image to entice the audience to seek more details. Assign the image a unique name to track the number of click throughs, which in turn will clue you in on the number of visitors the microbrowser impression has attracted.
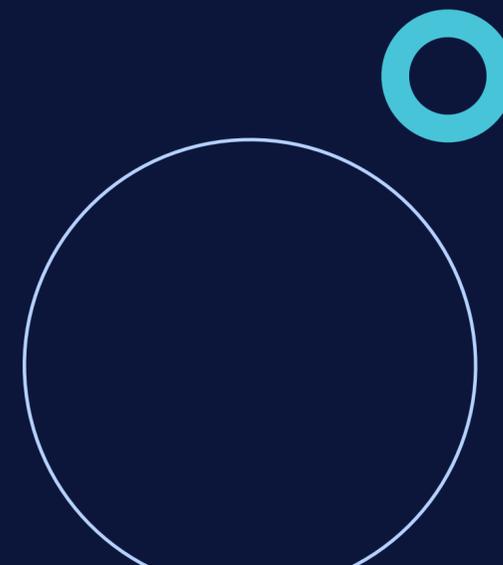
Post nanostories or animated GIFs.

Microbrowsers like iMessage display nanostories, i.e., short videos of less than 720 pixels, and animated GIFs that showcase key selling points. Note: Only videos in MP4 format autoplay. By default, they are muted and looped so be sure to add subtitles to them.

Add Open Graph tags.

As a protocol for expanding websites to facilitate content sharing among social channels, Open Graph promises to boost clickthrough rates.

```
<meta property="og:url" content="https://the-
url.com/of/the/page">
<meta property="og:title" content="A Page Title,
Optimized for Microbrowsers">
<meta property="og:description" content="A page
description, optimized for microbrowsers">
<meta property="og:image" content="/microbrowser-
preview-image.jpg">
```

Cloudinary

2021 State of Visual Media

Microbrowser tips and tricks

Cater to all microbrowsers.

Microbrowsers render links differently from one another even though most would display your favicon. Familiarize yourself with the differences and ensure that your content satisfies the various requirements.

Automate generation and enrichment of images.

Automate the manual, mundane, and time-consuming tasks of managing rich media with software tools and digital asset management (DAM) systems.

Ensure fast performance.

Latency issues exist for microbrowsers, which are not regular browsers. Post images and videos of a small footprint for efficient loading.

Cloudinary

About Cloudinary

Cloudinary's mission is to empower companies to deliver visual experiences that inspire and connect by unleashing the full potential of their media. With more than 50 billion assets under management and more than 8,000 customers worldwide, Cloudinary is the industry standard for developers, creators and marketers looking to upload, store, transform, manage, and deliver images and videos online. As a result, leading brands like Atlassian, Bleacher Report, Bombas, Grubhub, Hinge, NBC, Mediavine, Peloton, Petco and Under Armour are seeing significant business value in using Cloudinary, including faster time to market, higher user satisfaction and increased engagement and conversions. For more information, visit www.cloudinary.com.

cloudinary.com

About the Data

The data analyzed for this report comprises engagement patterns during December 2019 through April of 2021 across more than 670 Cloudinary customers, spanning more than a dozen vertical industries and a representative sampling of over 80 billion transactions per month.