

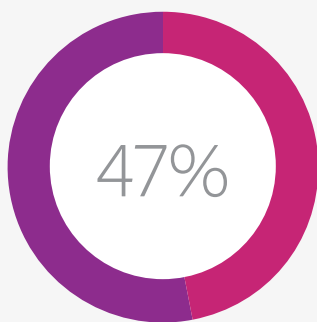
The magic of AI in a content-driven world.

Using artificial intelligence to create content faster.

She's a small girl, maybe four years old. Dark, curly hair. Twirling in her sun dress on a pristine white beach. It's a photo your designer knows is perfect—but it's hidden deep within your massive image repository. With hundreds or even thousands of images to dig through, not to mention deadlines to meet, he can't possibly take the time to find it. Wouldn't it be great if he could simply wish for it and—poof—the photo appears? With the magic of artificial intelligence and just a few keystrokes, all of this is possible. And it's not just wishful thinking. The technology is available now.

The need for new and personalized content. Presto.

We're in the midst of a content explosion. Consumers expect to have personalized, relevant experiences at all times, in all places, and on all platforms. An IDC survey cites that 85 percent of marketing professionals feel under pressure to create assets and deliver more campaigns, more quickly. In fact, over two-thirds of respondents are creating over ten times more assets to support additional channels. This increased level of complexity is driving volume and associated costs.



of marketers say that producing content at scale is one of their biggest challenges.

When you think about everything involved in creating this kind of content for thousands or even millions of customers at the breakneck pace required, doing it manually is no longer an option. Adobe's State of Creativity in Business 2017 survey show that already 40 percent of creatives are using AI in photo and design retouching. Searching for the images alone can take your designers hours, not counting the time required to manipulate them, crop them, put them into different layouts, publish them to online catalogs and social media channels, and serve them up to the right person at the right time. And we haven't even mentioned the costs of all that time. Or the costs of photo shoots to create new assets.

If you want to find and reuse assets more efficiently, deliver new and personalized content at scale, and get a better return on your investments, you need the help of artificial intelligence and machine learning.

Invoking the powers of artificial intelligence.

New advances in AI are automating many of the mundane, repetitive tasks involved in producing content. And doing it extremely fast—at high volume and with high production quality. When you free up your designers from these time-consuming tasks, they're able to focus on the parts of their jobs that require true, human creativity.

AI has even more power when used in customized workflows that allow you to not only find and manipulate assets more efficiently, but create complete campaigns with just a few clicks and deliver highly personalized and engaging content in minutes. Yes, minutes.

The great news is that a lot of this technology exists today and more exciting possibilities are close behind. Today's artificial intelligence technology can help you do the following:

- **Find and reuse existing assets.**
- **Automate image manipulation and image creation.**
- **Produce and personalize content at scale.**

Content understanding—summon the perfect image in seconds.

Designers simply don't have time to tag the hundreds of images uploaded from every photo shoot. Even if they did, the list of keywords probably wouldn't be as exhaustive as it should be. But when a photo isn't tagged, it's virtually impossible to find by searching in an image bank of thousands. But when a photo isn't tagged, it's virtually impossible to find by searching in an image bank of thousands.

According to IDC, marketers report that one-third of marketing assets go unused or underutilized with the average organization creating hundreds of new marketing assets each year. The likelihood of an image being repurposed is extremely low. Which means your ROI will be too.

Enter Auto Tag, an Adobe Sensei capability that automatically tags images with key words. Using our example of the young girl on the beach, some of those keywords might be *beach, girl, dancing, sun dress, blue sky, white sand, or Aruba*.

The Auto Tag service is used to power the Smart Tags features in Adobe Experience Manager, Adobe Lightroom, and Adobe Stock. "It's exciting to see the capabilities of auto-tagging," says Jonas Dahl, product manager for Adobe Experience Manager. "We did several manual search queries against a customer's repository and showed the assets we were able to find. Then we applied Smart Tagging and did the same searches. This time the results were significantly better and much more comprehensive. And in a fraction of the time."

Adobe Sensei technology has learned to automatically identify what is in a photo. And not just an object like a car or a girl, but the concept of the photo, including context, quality, and style.

Understanding AI, machine learning, and deep learning.

What does it all mean and how do they work? Here's a quick overview:



Artificial Intelligence (AI) is the field of computer science that studies how to make computers good at new types of tasks—particularly tasks that until recently could only be done by human beings.



Machine Learning (ML) is a subfield of AI devoted to creating programs that improve their performance when you give them more data, rather than requiring the improved performance to be programmed in by hand.



Deep Learning is a set of ML techniques that are loosely modeled on how neurons in the brain communicate with each other and adapt to new data. When trained on very large amounts of data, deep-learning systems can identify objects in photos, recognize faces and facial expressions, describe the style or mood of an image, and perform any number of other humanlike tasks—all at high speed and at scale.

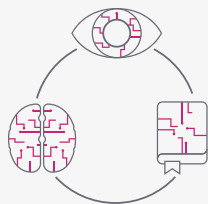
During an [Adobe Think Tank panel discussion](#) at Advertising Week 2017, Phil Gaughran, U.S. chief integration officer at agency McGarryBowen, made a bold prediction: By 2022, he said, 80% of the advertising process will be automated, "a threshold that will never be surpassed."

This means someone could search for an image with the words walking and slow. The search might result in an image of an elderly man using a walker, because the technology made the connection between slow and walker. And with Adobe Sensei auto-phrasing service, it can tell you even more. Each tag can be scored for prominence, so the machine understands what the primary and secondary objects are. This enables the technology to build a simple sentence or caption that more accurately describes the photo, such as “An elderly man walking with a walker in a park.”

Using the Adobe Sensei framework, you can train the AI and machine-learning models to create your own auto tags—customizing the models to learn and train on very specific parameters. This includes identifying brand characteristics like your logo, so your designers adhere to brand standards. Or training it to identify your products so that you can tag images on social media and identify your true reach.

Amazing experiences. Deeper customer insights.

Custom auto tagging not only increases your team's efficiency, but it opens the door to exciting new customer experiences like image-based shopping. Now it's possible for a customer who is looking for a new couch to upload a photo of one they like and shop for it based solely on the image.



Harnessing deep data and deep expertise.

Adobe Sensei uses a unified AI and machine-learning framework, along with Adobe's deep domain expertise in the creative, marketing, and document segments, to harness the company's massive volume of content and data assets—from high-resolution images to customer clicks.

It's possible because auto tagging identifies what is in the photo and finds the best matches. Custom auto tagging also allows you to gain a deeper understanding of your audience and market trends in social media, without having to rely on tags and text. If you run a social media feed through Adobe Sensei, it will tag places your brand is pictured, even if it's not mentioned or tagged, allowing you to see what is trending.

Computational creativity—conjure up edits at phenomenal speed.

Once an image is located, it can still take hours to manipulate it, crop it, and create the many different sizes and versions your campaign requires—unless you're using AI. Let's look at some examples of the types of services available with Adobe Sensei and how they can deliver more engaging customer experiences, more efficiencies, and greater ROI.

Deep cutout.

Save money on photo shoots by repurposing existing images and hyper-personalizing them. Your designers can automatically remove an image's background and replace it with one that fits your brand guidelines—such as a white background for all web images. Or soon, they'll be able to mask out an area such as a highway, and in just a few clicks, see what it looks like with a river, neighborhood, or other background—completely reinventing the photo in seconds.

Auto crop.

Time spent cropping and sizing images for different aspect ratios eats into valuable design cycles. But now you can automate this process by training the auto-crop model to crop images in adherence to your brand guidelines. For example, a shoe manufacturer may have guidelines that require only the shoe be shown, so they can automatically have all photos cropped accordingly.

Image quality.

You can train the API on image aesthetics so it automatically selects the best image and rejects anything that is below a certain standard. Quality validations can be based on exposure, focus, color balance, depth of field, and more. This saves valuable time by automatically eliminating lower-quality images.

Employ the magic of custom workflows.

Using the capabilities described above, your team will be able to generate hundreds or thousands of campaign assets in no time. Even just one of these capabilities can result in incredible time savings. But as you combine them together, the velocity at which you can create content gets faster and faster. The real power of the technology—and cost savings —come from creating custom workflows that allow you to search, mask, crop, and publish in minutes.

Suppose you're a company that creates marketing campaigns across several countries. This type of custom workflow eliminates the tedious, manual work involved in creating all of the different assets, and it allows you to scale your campaigns to as many countries as you need. When your designer uploads a file to Adobe Creative Cloud, a custom workflow kicks off a series of Adobe Sensei Content AI Services that expedites the entire process from tagging, to cropping, to delivery of your production-ready asset to Adobe Experience Manager. All of this happens in a matter of hours instead of days.

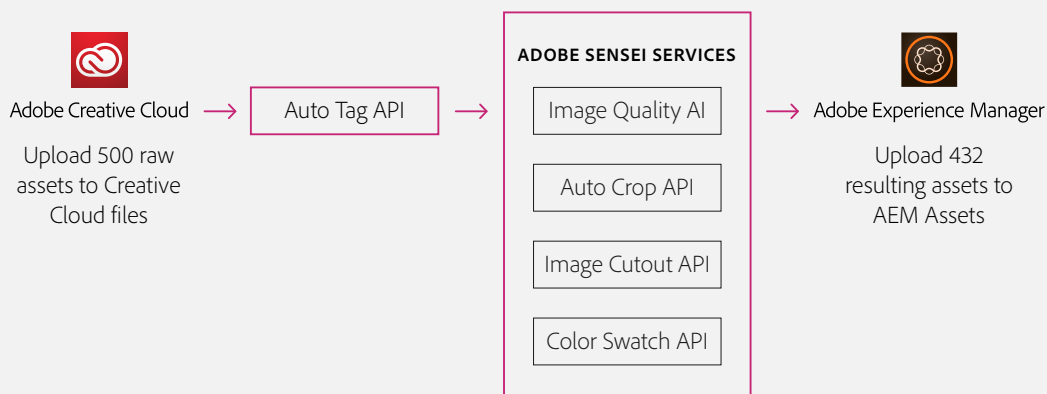
We're now making Adobe Sensei technology available to our enterprise customers as APIs to build upon, customize, and create their own instructions for what they want the technology to do. "If you think about Adobe Sensei, it's like a recipe book with each individual API a different recipe. You're ultimately the chef. You can use what you like," explains Todd Burke, solution consultant for custom integrations at Adobe.

Experience intelligence—deliver the right content to the right person at the right time. Every time.

Using AI becomes even more valuable when applied to both your content and your audience data. "When you can combine what you know about the image with what you know about the customer from online and offline behaviors, you can micro-target customers with content that is truly relevant," says Richard Curtis, principal solutions consultant for Adobe. Furthermore, the machine will continue to learn customer patterns that help you fine-tune your personalization even further. Curtis, principal solutions consultant for Adobe. Furthermore, the machine will continue to learn customer patterns that help you fine-tune your personalization even further. As Richard notes, "More personalization leads to more clicks." And more brand loyalty.

Take this one step further with custom workflows that automate the creation and delivery of beautifully designed, personalized campaigns, and you tap even deeper into the power of AI. And see even more efficiencies and cost savings.

Create custom workflows to accelerate asset production.



Adobe unlocks the magic of AI from creation to delivery.

Adobe Sensei delivers opportunities across the entire experience creation journey. "Adobe is relentlessly focused on creating amazing digital experiences. Our efforts are focused in domains where we excel—from finding content, manipulating it, and then actually publishing it in the world, to measuring what happens with it and feeding that data back in for the machine to learn from," says Scott Prevost, vice president of engineering and search at Adobe. "There's no other company in world with the data resources and ability to use AI, machine learning, and deep learning at all various different steps in the process like Adobe."

Artificial intelligence is a technology that, perhaps ironically, will enable more human empathy in the creation and delivery of content. By relegating many of the time-consuming and tedious tasks to the machine, you can spend more time understanding and empathizing with your customers. And creating experiences that resonate more deeply.

Learn how you can become an Adobe Sensei lighthouse customer.

Email sensei-lighthouse@adobe.com to request access to the beta program for Adobe Sensei Content AI services.

Access Adobe Sensei across Adobe clouds.



Adobe Experience Cloud



Adobe Creative Cloud



Adobe Document Cloud

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