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Drive business growth with personalization

How machine learning helps you create highly personalized and engaging customer experiences

Providing better customer experiences and improving business outcomes with personalization

Personalization offers your organization the ability to improve brand loyalty, grow sales, and increase efficiency by using data to create more sophisticated and individually tailored customer experiences. This allows you to delight and engage your customers by delivering the right experience at the right time and in the right place.

According to a 2021 McKinsey report, organizations that have implemented personalization realized a 10–15 percent lift in revenue. For companies that run fully digital operations with a direct-to-consumer model, personalization drives even more value, achieving up to a 25 percent lift in revenue.[1]

As customers spend more time online engaging with brands through new digital channels and across a growing range of devices, they are increasingly expecting real-time, highly personalized experiences. In fact, 71 percent of consumers see this type of experience as the standard level of service.[1]

However, many organizations are struggling to realize the benefits of personalization in meaningful ways. Irrelevant communications and recommendations frustrate customers, resulting in disengagement and, ultimately, lost sales.

In the next section, we will review those challenges—and the reasons behind them—in greater detail. Then, throughout this eBook, we will show how Amazon Web Services (AWS) machine learning (ML) is changing the game, powering solutions that can help you realize the full potential of personalization in the digital era.

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[1] Arora, N., et al., "The value of getting personalization right—or wrong—is multiplying," McKinsey & Company, November 2021
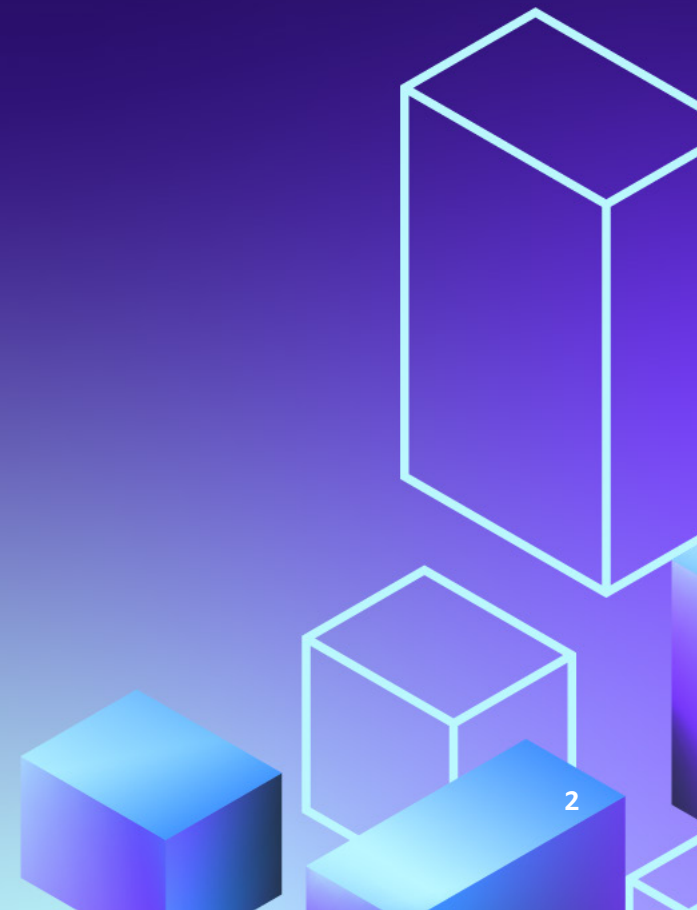
Challenges to succeeding with personalization

There are three key challenges to personalizing digital experiences:

1

Channel platform and systems integration

It's hard for organizations to create a seamless, personalized experience across multiple consumer channels and touch points and throughout their various internal systems. For example, an organization's website may be hosted on Magento, a web application on Symfony, and email communications on Marketo. Integrating a personalization solution across these disparate platforms can become overly complex. Many organizations are not in a position to completely overhaul their current infrastructure and instead seek solutions that are compatible with their current setup—creating even further disconnect between internal platforms and fracturing customer experiences.

2

Data volume, complexity, and maintenance

Most organizations maintain a wealth of customer data that could be used to support a personalization solution. This includes customer relationship management platforms (CRMs), promotional emails, and third-party data that can help to paint a 360-degree view of an individual customer. However, ensuring the quality of each unique dataset and stitching together data from multiple sets is a daunting undertaking for many organizations. To deliver the right experience to the right customer at the right time, organizations must go beyond basic customer information—capturing and incorporating behavioral data in real time and at scale.

3

Limited scale and ROI from rule-based recommendation systems

Most existing systems for personalization provide recommendations based on simplistic, predefined rules (for example, "if you are X, you will see Y"). These systems are static and require significant manual maintenance. Although they are easy to use and understand, it is challenging to define rules that are specific enough to consumer segments to offer meaningful personalization. Also, human effort to maintain these solutions increases as needs scale, causing performance to diminish as the solution expands or the company grows. This results in poor customer experiences and decreased ROI.

Overcoming personalization challenges through machine learning

ML is powering a new class of personalization solutions that is no longer held back by modern and legacy challenges. Through greater scalability, automation, and intelligence, these solutions can incorporate behavioral data and inferred preferences to deliver highly relevant, enticing experiences that are truly tailored to an individual customer—rather than generic segments of people. ML can do this by helping to process vast amounts of customer data and then selecting the right algorithms to dynamically present the most relevant products or content to each and every customer at the right time.

ML solutions are easier to manage and integrate into your existing workflow, allowing you to address real-time customer needs by creating more relevant experiences at scale. They can also address common problems like *popularity bias* (merely showing a customer the most popular products) and *cold start* (where no user history exists), helping customers find more relevant items and discover new products that are relevant to their interests—even when those products are not particularly popular or information on that customer is limited.

In the next section, we will show you how you can leverage AWS ML to deliver on the promise of personalization through the use of specific AWS services.

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Generative AI and machine learning services for personalization

Amazon.com pioneered personalization in 1998 when it introduced an array of features to better serve book buyers, including instant recommendations from its large catalog. Since then, Amazon has leveraged decades of research in personalization to enhance the customer experience across Amazon.com, Prime Video, Amazon Music, Kindle, and Alexa through recommended items and content widgets. AWS customers can take advantage of these decades of experience to enable developers to build applications with ML techniques used by Amazon.com for real-time personalized recommendations.

AWS offers organizations three approaches that can be used to implement personalized customer experiences, depending on the stage of your personalization journey, business landscape, and desired business outcomes.

Amazon Personalize is the fastest and easiest way to start leveraging the power of personalization today. It's a service that allows you to create real-time personalized user experiences at scale, making it possible for any developer to implement a sophisticated recommendation system in days, not months. Amazon Personalize enables you to maximize the value of your data to create authentic connections with your customers—with no prior ML expertise required. And it easily integrates into your existing websites, apps, SMS, and email marketing systems to expand personalization across all channels and devices.

If you want to create your own ML models for personalization, **Amazon SageMaker** provides you with all the tools you will need in one place. SageMaker is a fully managed service that helps your business analysts, data scientists, and ML developers prepare data and build ML models quickly. For recommendation engines, SageMaker offers built-in algorithms such as factorization machines, hundreds of pretrained models, and algorithms available through **Amazon SageMaker JumpStart**, as well as the option to develop your own algorithms.

Generative artificial intelligence (AI), powered by foundation models (FMs), can also be used for personalization. **Amazon Bedrock** includes some FMs, like **Amazon Titan**, that support vector embeddings, vector numerical representations of a word, phrases, or items. These vector embeddings capture semantic relationships and similarities and can be used to make personalized recommendations, match users to relevant content, or tailor search results. **Generative AI** can also be used to create personalized messages and images.

In the next section, we will outline the primary use cases for personalization. We will show how these and other AWS ML services can power and generate dynamic solutions to accelerate the performance of each sample use case. Then, we will take a look at how AWS ML can deliver results for personalization across specific industries.

Personalization use cases

1. User personalization

User personalization refers to the products, services, or content that a user sees in a "recommended for you" widget generally found on your company's website or app. Although many existing solutions offer this feature, these systems are often only informed by data provided by users during initial account creation, most commonly with static rule-based techniques. AWS ML can power solutions that extend far beyond this, enabling dynamic recommendations that are informed by user behavior, real-time changes in business intent, and purchases.

With AWS ML, you can also add personalized recommendations to new engagement channels, such as display ads, emails, app notifications, social media, and text messages.

Content can be curated to match unique customer behavior across these channels, improving the relevance of recommendations being generated. With contextualized recommendations, Amazon Personalize considers things like device type, location, and time of day/seasonality. For instance, if a user of a content streaming site tends to watch TV shows on their mobile device and full movies at home, an ML-powered solution can automatically recognize and adjust the recommendations generated within each channel based on that information.

2. Similar items

Through *similar items,* customers who are browsing products, services, or content on your websites or apps can be offered items related to the ones they're currently viewing. *Similar items* is a widely available feature, but most existing solutions base the populated items solely on attributes of the item itself or user preferences. AWS ML helps you to go beyond static datasets to provide recommendations based on behavior data to closely align with the user's intent. This enables experiences where the customer sees recommendations in the form of "users who watched X also watched Y."

Adding this layer of true personalization creates trust between you and your customers by helping them with product discoverability, thus demonstrating that you understand who they are and what they like. *Similar items* also enables you to quickly build demand for new products and content in your catalog that your customers might otherwise not be aware of as they shop for or view their standard go-to items.

3. Personalized rankings

Personalized rankings refers to the continuous re-ranking of search results on your website or app to reflect a user's activity and preferences within your business rules—as well as the more common application of category-based recommendations. For instance, if a user who typically only stays at four- or five-star resorts were to search for "Chicago hotels" on a travel site, personalized ranking features would place prestigious hotels at the top of the user's results page. Many existing approaches to recommendations don't offer this capability, and of those that do, most cannot adapt to real-time changes in user intent.

AWS ML can help you realize the deep functionality and wide scalability required to make truly *personalized rankings* a reality, guiding customers to items they are more likely to purchase and enjoy—while potentially exposing them to entirely new categories of your offerings.

4. Intelligent user segmentation

Intelligent user segmentation allows you to run more effective marketing campaigns with existing and prospective customers. With other personalization services, user segmentation is rudimentary, solely relying on demographic information and manually curated business rules to make assumptions about user intentions, assigning them to predefined audience segments. *Intelligent user segmentation* with AWS leverages advanced ML techniques to learn about your catalog items and how users interact with them to segment users based on their preferences for different products, categories, brands, and more. This can help drive higher engagement, increase retention through targeted messaging, and improve the ROI for your marketing spend.

5. Use case optimized recommenders

To realize the true potential of personalization, businesses need to tailor their content to the individual user journey. Each touch point requires advanced personalization that understands the user, their current context, and their real-time interests or in-session preferences when delivering recommendations. With Amazon Personalize, you'll deliver personalized experiences based on the metrics that matter most to your business and the unique preferences of your individual users. We've developed a suite of pre-built recommenders most relevant to industries like retail and media and entertainment (M&E) that you can integrate into any existing application with easy-to-use APIs, making it even easier to personalize your websites, apps, and marketing campaigns. You can select from a library of common recommenders like "Frequently Bought Together," "Because You Watched," "Top Picks for You," and more. Amazon Personalize chooses the optimal settings for your use case and automates the work of creating and maintaining personalized recommendations, enabling you to quickly deliver high-performing personalized user experiences.

6. Unstructured text

Unlocking information in *unstructured text* stored across multiple systems empowers you to unify your data, ultimately creating more meaningful customer experiences. Useful data that can unveil insights on customer preference goes overlooked every day because it oftentimes is trapped in product descriptions, product reviews, movie synopses, or other unstructured text. These are critical details that could generate highly relevant personalized recommendations. For example, product descriptions provide important information about the features and benefits of products. AWS ML can use the investments companies make to create these narratives to increase the relevance of recommendations for products, movies, TV shows, news articles, and more.

Machine learning for personalization in retail

Today's retail companies, whose product catalogs can span hundreds of millions of offerings across multiple brands, must adapt to pricing pressures, market disruption from emerging players, and the ever-evolving expectations of customers. Those challenges, combined with the prevalence of legacy technology stacks, are making it difficult for the retail industry to gain a holistic understanding of their customers' behavior.

In order to overcome the demands of an ever-changing shopper and technological landscape, retailers of the future will need to systematically harvest structured and unstructured data across multiple sources. This data can be applied to advanced, predictive algorithms that turn AI-driven insights into foresight and recommended actions. Investment in adaptive data platforms, advanced analytical tools, and AI capabilities will allow retailers to turn data into a strategic advantage. AWS ML can be used to power solutions that combine interaction data with customer and item data from multiple systems to make more accurate predictions about customer purchase intent and behavior. With these insights, your retail business can start engaging customers with relevant experiences across channels to drive awareness, consideration, and purchase.

Let's take a closer look at common personalization use cases for the retail industry—and how AWS ML can help bring them to life and enhance their benefits.

Retail use cases

1

Deliver unique homepage experiences

Personalize users' homepages with product recommendations based on their shopping history

2

Help customers discover products faster

Help users quickly find relevant new products, deals, and promotions

3

Enhance marketing communication

Personalize push notifications and marketing emails with individualized product recommendations

4

Refine product recommendations

Recommend similar items on product detail pages to help users easily find what they are looking for and reduce cart abandonment rates

5

Relevant product rankings

Easily re-rank relevant product recommendations to drive tangible business outcomes

6

Boost upsell and cross-sell

Provide relevant, enticing, personalized offers at the point of purchase or checkout

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Customer highlights

MECCA

MECCA, an Australian beauty retailer, has successfully translated its trademark in-store beauty consulting services to its digital outlets using Amazon Personalize to imbue its email marketing communications with individually tailored recommendations. Since implementing Amazon Personalize, email click-through rates are up 65 percent, and sales of recommended products have increased.[2]

zalando

Zalando, Europe's leading online platform for fashion and lifestyle, uses Amazon SageMaker to steer marketing campaigns, generate personalized outfits, and deliver better experiences for its customers. Among other positive results, SageMaker has helped the company improve the productivity of its data science team by 20 percent.[3]

[2] "How Mecca Is Mirroring In-Store Customer Experiences Online—with Dramatic Results," AWS case study, 2021
[3] Sánchez Fernández, F., "Building ML Workflows at Zalando with zflow," November 2019

Machine learning for personalization in M&E

The business model of the media and entertainment (M&E) industry has changed. The distinctions between print and digital, video games and sports, pay TV and over-the-top (OTT), and social and traditional media are blurring. Audience expectations for nearly endless content choices anytime, anywhere, and on any screen are driving substantial business and operational changes. M&E companies need to be able to deliver content directly to an audience that is engaged with the brand—and do so in a cost-effective manner.

M&E organizations are transitioning from a one-to-many distribution to a direct one-to-one relationship with their viewers. As organizations realize they need to build closer relationships with viewers, they must create more personalized direct-to-consumer models. AWS ML gives M&E organizations the ability to build strong direct connections with consumers and deliver innovative viewing experiences. It helps you create personalized, channel-curated content recommendations across multiple devices and platforms, empowering your business to deliver seamless entertainment for customers as they jump between their desktops, mobile devices, and smart TVs. And AWS ML can power solutions that scale across millions of products and titles, remaining resilient as content is added and removed.

Let's take a closer look at common personalization use cases for the M&E industry—and how AWS ML can help bring them to life and enhance their benefits.

M&E use cases

1

Increase content consumption

Deliver highly relevant, individualized recommendations for videos, music, eBooks, and other content

2

Provide highly curated content carousels

Create personalized content carousels for every user based on their content consumption and history

3

Highlight new content offerings

Help users find fresh, new content based on their unique tastes and preferences

4

Create highly personalized ad placements

Personalize pre-roll, mid-roll, and post-roll ad placements within audio and video content

5

Improve marketing communication

Personalize push notifications and marketing emails with individualized content recommendations

6

Enhance genre-based recommendations

Add individualized recommendations to genre-based content carousels and lists

Customer highlights

WB

WARNER BROS. DISCOVERY

Warner Bros. Discovery, a premier global entertainment company, wanted to build a promotion engine to customize movie and show recommendations for unauthenticated users across its digital properties and drive cross-brand engagement with existing customers. With Amazon Personalize, Warner Bros. Discovery quickly built a real-time recommendation engine leading, to a 14 percent increase in total user engagement and a two-times increase in response rates for personalized content recommendations.[4]

iHeartMEDIA

iHeartMedia, the #1 audio company in the US, uses Amazon SageMaker to recommend relevant radio stations to new users of the iHeartRadio app in the form of messages directly after registration. In a 10-day A/B test, the model hosted on SageMaker had an 8.7 percent higher click-through rate, driving more users to start listening—while still maintaining equally strong listening time.[5]

[4] Amazon Personalize Customers
[5] Fielder, M., Rosenblum, J., "Real-Time Music Recommendations for New Users with Amazon Sagemaker," AWS Machine Learning Blog, November 2019

Start realizing the power of machine learning personalization today

There are several ways to get started with AWS ML for personalization. In addition to using **Amazon Personalize**, **Amazon SageMaker**, or **Amazon Bedrock**, you can leverage **AWS Professional Services**, a global team of experts that can help you deploy personalization and other services to realize your desired business outcomes when using the AWS Cloud.

You can also **train your developers and data scientists** to build custom personalization models and gain a stronger understanding of ML in general. Our training initiatives use the same curriculum we use at AWS, and many courses are available on demand and at no cost. We can help everyone in your organization—executives, developers, and data scientists alike—become more proficient in ML.

Finally, you can **contact us** directly for more information about personalization or visit the **AI Use Case Explorer** to discover other use cases.

Any of these choices can help you use ML to bring the power of personalization to life—so you can create experiences that delight your customers, grow your business, and differentiate your offerings in today's highly competitive digital world.

Find out more ›