



# AI, Automation and Machine Learning: a Deep Dive into Personalization



# Contents

## Introduction

02

Chapter 1

## The History of Personalization

06

Chapter 2

## Automation and Machine Learning

10

Chapter 3

## The Future of Personalization

15

Chapter 4

## Your Brand and Personalization

20

Chapter 5

## Conclusion

25

# Introduction



There's no denying it: over the last few years, personalization has fully disrupted the world of e-commerce. A few short years ago personalized shopping experiences were just desirable. But with nearly two-thirds of shoppers expecting brands to deliver them – today, they're required.

You've likely introduced some personalized-based solutions into your business by now. You might have seen some impressive results. But have you ever really wondered how it all works?

We don't just mean the surface level stuff. We're talking about the technology behind personalization. The engine that drives it.

If you're like many people who work in e-commerce, you probably haven't dwelled too much on the technicalities of personalization. After all, if it gets results, then does it even matter how it works?

## A Missed Opportunity

If personalization is a car, then most businesses are driving on cruise control. And they're so busy enjoying the view, they don't even notice there's a turbocharged supercar engine under the hood.

You might be the one driving. But if you know nothing about the machine you're in, how do you know just how fast you can go?

We're not suggesting you need to start thinking like the developers that design this technology. But gaining a deeper understanding will give you a significant advantage, because you'll have a stronger awareness of its powerful capabilities.

## Knowledge is Power

A deeper understanding has practical benefits, particularly when it comes to vetting potential solutions and negotiating with vendors. Armed with knowledge, you can be more confident in your buying process because you're able to suss out when someone is trying to sell you solutions you don't need, at prices that don't reflect their actual value.

And there are other benefits, too. The technology behind personalized solutions is progressing, fast. A more extensive understanding will give you the ability to actually see its potential, maybe even possibilities that haven't been offered to you yet. And you'll have the confidence to choose the most innovative, cutting-edge tools from vendors, or even approach developers to build custom-solutions for your business.

In short, learning about the small details actually helps you to **think big**.

But we know you're busy. You probably lack the time to really get to grips with personalization, its inner-workings, and all its uses.

We wrote this ebook to help you further your knowledge. In the following chapters, you'll gain a deeper understanding of personalization: what it is, what it can do, where it's going, and how you can make it work for you. And at a 20 minute read, you'll learn it fast.

In Chapter 1, you'll learn all about the history of personalization. We'll cover its origins, and how the technology has grown over time. We'll also look at

the emergence of AI technology, and its usefulness in relation to personalization.

In Chapter 2, we introduce the technology that followed this origin story, as AI's applications became broader and more advanced: machine learning and automation. These are hot technologies right now, so it's important to understand how they work and what they do.

Chapter 3 looks at where personalization is headed in the future. Specifically, we explore how the technology we cover in the first two chapters is helping to create a tailored, meaningful experience for customers.

And in Chapter 4, we introduce you to ideas that you can use to help you prepare for this exciting future.

# Chapter 1: The History of Personalization



Let's start by looking to the past, when it was the responsibility of brands to know their audience well and market towards them, so that their product would get picked up by advertising algorithms and put in front of their ideal clients. In that sense, personalization was often mediated by a third party, like an advertising agency. Usually, personalization at this time would have taken the form of segmentation — targeting by industry, age, and behavior patterns, among other key identifiers.

**Segmentation** is broad in nature, with surface-

level depth. It offers a general view of your customer base, so marketing is generalized too. It also misses out on unobserved categories, or connections between two variables that are easily overlooked.

To address this problem, the market began taking advantage of new technologies that were better equipped to spot links and patterns between different identifiers and their shopping habits. Namely, it began to utilize more advanced technologies that were driven by AI. And it opened up a whole world of possibilities.



## Why is that?

When we're discussing segmentation, tailored marketing, or any element of the customer experience, it starts with data. In its raw form, data isn't complex at all. What makes it difficult for humans to deal with is its scale, and understanding how different data is related.

Computers have been helping us speed up this process for a while. But in the past, we had to manually tell a computer what to look for when we wanted it to process a data set. We'd ask: "What percentage of our customers are female?" or, "Which age group has the highest engagement with our brand?". After that, we'd go away and come up with a plan to target those people.

This is useful information, which hasn't stopped being important. But what about more complex queries?

Take a common question you might want answering: "How does the way customers engage with our website affect sales?" It seems simple enough on the surface. So let's break it down.

To answer this question, you'll want to collect some stats like:

- Length of time on site and number of pages visited
- Where they came from (Facebook, Instagram, Google search)
- What they did on your site (Search bar, general browsing)
- Whether they made a purchase, and how much they spent
- Whether they returned and in what time period

Tools like Google Analytics are likely to glean some interesting information from the data you find. For example, that the customers who came from social media spent more time browsing than the ones who arrived from Google search, but the ones who arrived from Google spent more money.

While helpful, this kind of information isn't very detailed, and it's difficult to pinpoint exactly why these results are the case. This is where AI shines.

## The Power of AI

With the arrival of AI techniques such as Self Learning, a computer could further outperform a human in terms of data processing and pattern finding. This is advantageous for a few reasons:

### 1. It will identify categories you didn't think of

Once they're set up with initial metrics, self-learning programs don't need to be told what to look for, so they won't miss anything you don't tell them to look for. Take the example above. What if the people who received a response from your brand on social media posts were more likely to make a purchase? Before AI, you would have missed this vital information.

### 2. It further removes the need for manual processes

Because personalization with AI is automatic, there's no need for manual input to decide which people should see which content. It also makes it easier than ever to learn from huge data sets.

### 3. It will give you a more complete picture of customer behavior

When all the different variables are accounted

for, you will have a fuller understanding of exactly what drives a customer's shopping habits. This can give you a complete picture of their wants and needs, and enable you to offer a much more tailored experience to the individual. The end result? More conversions for you.

In essence, advancements in technology have taken a lot of the guesswork out of marketing. Generally, the only input an AI program needs is data to process, and to know what your desired outcome is. So AI needs to know what you want it to achieve. Often, that will depend on the type of program you are running. But generally, most [AI-driven personalization applications](#) are geared towards spotting patterns that help your business **increase sales and gain revenue.**

But you may have noticed that what we've discussed is still in the realm of segmentation. Personalization – where we are currently and what we are striving towards – is all about catering to customers as individuals. This is where the true potential of personalization lies. It's come about from the marriage of AI with automation, and advancements in a category of AI called machine learning, which we'll discuss in the next chapter.

# Chapter 2: Automation and Machine Learning



It's an exciting time in tech. The rise of digital automation is leading to the biggest shift in markets since the dawn of machines in the industrial revolution.

On paper, automation is extremely easy to understand. Humans are smart, but slow. Computers on the other hand, can process information very quickly. Automation takes the most monotonous tasks and gets them done faster. And this is as true for online retail as

for any other digital industry. From workflow and productivity to shipping and receipts, automation is embedding itself into every aspect of e-commerce business practice.

Machine learning (ML) takes this automation one step further by adding a layer of prediction to the process, allowing automatic decision making to produce the optimal results when processing the data in question.

## So what does this mean for personalization?

When combined with self-learning programs, automation can work behind the scenes to target **groups and individuals**, based on the data it collects about them and their shopping habits.

The basic foundation of a self-learning personalization program works like this:

1. First the program **observes** the measurable online activity of customers, collecting and storing the data as it does so. The quality of this data dictates how accurate the ML output will be.
2. Next the **data is prepared** for processing by cleaning out any duplication, errors, missing values or incorrect data types. This ensures the data set is nice and workable.
3. Then, depending on the type of data, a **model** for the machine learning aspect is selected based on the appropriate use case.
4. It then parses through the data to look for similarities, sorting it into **categorical groups**.
5. Then, the program **identifies patterns**, by spotting any groups of data that have correlational relationships with each other. It will also look for context of an individual users activity in order to provide the most appropriate personalized output.
6. It then uses the collected data to show customers content that is **relevant to them**.

You may have felt that the leap from step 5 to 6 was a bit big, but it's really quite simple. In practice, if the algorithm found that an individual or group of customers visiting a fashion outlet site has a preference for red shoes, it will simply show them more red shoes (for as long as they continue to show a preference for them).

Here's a famous example. You may remember a story that went viral back in 2012 about the time Target found out a teenage girl was pregnant before her father did. It happened because Target's AI-driven algorithms figured out common

online habits that are a giveaway for pregnancy. They developed a “pregnancy prediction score”, and used it to target the women who ranked highly, with pregnancy-relevant coupons. As a result, the girl’s father found out about her pregnancy after she was inundated with promotions for moms-to-be in the mail.

Even though this happened quite a few years ago, it’s still an interesting story. The tech has improved since then, which means that it can perform even more complex tasks.

This is in fact the beauty of it. Implementing something in-house is not always viable, and a black box solution is great as it does all the hard work behind the scenes.

Before we discuss how personalization can help you in more detail (which we’ll do in Chapter 4), we’ll talk about how ML is pushing the boundaries of what applications can achieve. Specifically, how programs use ML to get better over time.

By continually updating the data sets with new

information it collects, programs driven by ML algorithms improve over time. By doing so, they are able to respond to changes in the market, such as a shift in consumer habits, quickly.

## What does this look like in practice?

Imagine you’re a hot new label, and a brand new shopping trend has sprung up on social media. Popular influencers have been posting campaigns wearing your hats. Different machine learning capabilities can help online stores cater quickly to this new trend, in a couple of key ways ...

### 1. ML Can Predict Trends

Because ML applications are always collecting data, they become very good at learning detailed information about any and all relevant shopping trends. Over time, ML lets the application learn all of the changing factors that determine what makes a trend, including whether it will stick around, or is just a passing fad.

Over time, applications will learn to predict whether a new trend is one to jump on, or let

pass by. This can be a huge help when planning promotional campaigns or deciding whether to introduce new products into your store.

In our example case of the hot new label above? The algorithm predicted that sales will hit a high spike in the next quarter, before tapering off and then stabilizing over the next 12 months. Better get those promotions ready!

## 2. ML Helps You Know Your Customers

ML applications can use all incoming data about your customers to your advantage. There are solutions that log all the ways your customers engage with you. Every time a shopper visits your site, reads one of your blogs, or engages with you on social media, is an event that can be collected, observed and measured to the benefit of that customer's experience.

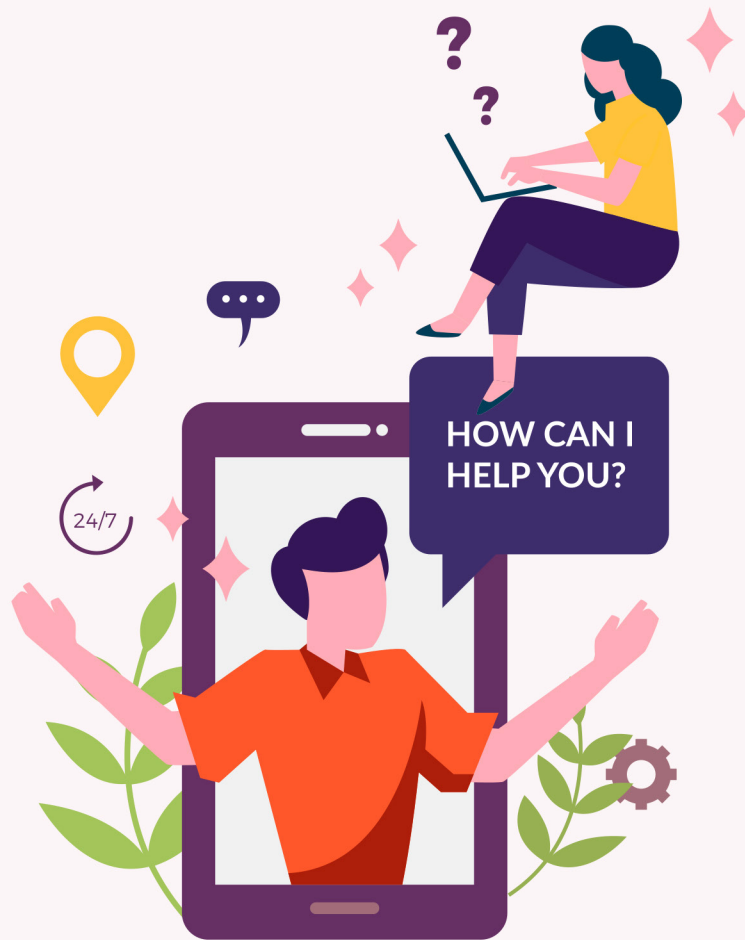
Not only does it allow for better catering to that particular customer, it can also improve personalization for future customers with similar traits, shopping habits or demographic information.

For the example case we're following, the algorithm predicts that people following this trend are likely to buy on impulse, and will be very responsive to short-lived promotions. Perhaps a 2 for 1 flash sale is on the cards?

When ML is combined with automation, you can know your customers inside and out. And then, you can give them exactly what they're looking for.

# Chapter 3: The Future of Personalization





You might have noticed that up until now we've been talking about personalization in terms of individuals and groups of people. This is because while personalization for individuals has existed for some time, it is this area that will see the most drastic improvements moving forward.

If you want to know where personalization's most exciting potential lies, you must look to the future. The best is yet to come.

So, what does the future have in store for the growing technology?

The merging of personalization with ML and automation has created **hyper-personalization**, a buzzword you're probably familiar with. And it is this advancement that will be the foundation for the future of personalized shopping experiences.

Many see it as just the next iteration in a long line of iterations. Simply a more advanced form of its predecessor – regular ol' Personalization. And it is ... on paper.

The potential this newer technology presents is exponentially greater than what has come before it. It's not just a step up – it's a step out, in many directions, all at once.

And as it develops, e-commerce will grow with it. Brands will continue to move away from traditional channels like email, towards a more bespoke form of customer service.

These changes are emerging in a few distinct but related ways ...

## One-to-One Customer Service

Because of the rise in multi-channel marketing — where customers are increasingly expecting that companies interact with them across multiple platforms — brands are placing even more of their resources into using social media channels, like Facebook Messenger.

This is for good reason, as intelligent chatbots have more capabilities than ever. Customers are becoming very receptive to the technology's many uses, from recovering abandoned cart sales to receiving promotions. And with 67% of customers worldwide using a chatbot for customer support in the past year, it seems that modern customers like the convenience and speed they offer. Some chatbots allow shoppers to make purchases directly in the chat window — a practice that will soon become routine.

A great example of this is Simplr, who use AI and

machine learning to streamline customer support services across a variety of platforms.

## More Powerful Recommendations

On-site personalization will also experience a complete overhaul in the years ahead. The combination of machine learning and automation means that an online store's website can now offer far more than basic recommendations.

As capabilities grow, merchants are beginning to deliver a more personal and immersive user experience for their customers.

A great example of this is fashion solution [Easysize](#), who wouldn't exist without big data analytics and AI. By analyzing data on the shopping habits of individual shoppers, and comparing it with data on individual garments, Easysize allows online retailers to tell each customer how well each item of clothing will fit them. And it works. Returns are decreased by 35-40%.

The emergence of recommendation tools like Easysize is manifesting in a number of ways that all share two common goals — to get customers to the checkout, and ensure repeat sales.

One of the ways to help shoppers get to the checkout quickly is by removing any sources of friction. Personalized search results help you achieve that, and more, by helping customers find exactly what they're looking for. And when they're pleased by the ease and relevancy of shopping with your brand, they're far more likely to return to make future purchases too.

## Anticipating Shoppers' Likes and Dislikes

The great thing about all these predictions is that they can be used to anticipate your customers' needs. This presents an opportunity for brands to more effectively target individual shoppers with promotions and campaigns for a specific product before they even search for it.

Likewise, knowing what turns a customer off a sale is just as important. Modern ML-based data analytics tools are very good at pinpointing where customers are experiencing barriers to purchase, and identifying what caused them in the first place.

It's much easier for you to remove sources of friction in the customer journey than it was in the past. So it's worth seeking out these kinds of

solutions for your business, or learning how to fully utilize those you use already.

The result of this is not only a significant reduction in missed sales. As people are far more likely to remember a negative experience than a positive one, you'll also benefit by increasing the number of shoppers who only have positive associations with your brand.

## Helping Merchants Make Better Decisions

The data-processing that drives personalization gives you an in-depth look at your customers' behavior. You'll learn exactly how they use your site, and what they want from it. The depth of this information helps you make much better decisions for your business.

Take British snack subscription-box retailer, Graze. Once they tapped into ML, they realized they could draw deep and meaningful conclusions from their customer data. This set them up to make a bold business move: to base their entire merchandising strategy around personalization, and make it entirely automated.

With 20 million possible combinations, they use custom algorithms to create subscription boxes that continue to surprise and delight customers, every time they receive one.

You could say that their success as a brand has less to do with the products themselves, and nearly everything to do with their utmost dedication to personalization. There are plenty of subscription companies that also stock delicious treats. But it was Graze's leap forwards in data-driven personalization that saw them reaching new heights, despite operating in an increasingly saturated market.

For businesses wanting to follow in Graze's footsteps, the risk involved with such brave strategic moves will lessen over time. Any decision that in the past involved a level of speculation, will soon be backed up by much more solid predictions based on real data. Any changes you make to the user experience will be heavily guided by systems and programs you can trust.

## Meaningful Customer On-site Experience

In a few years, personalization will create an online experience akin to great customer service in a physical store. You'll be able to find exactly what you're looking for with ease, with bespoke recommendations created just for you.

This, and all the developments we've listed in this chapter, creates an experience that is responsive to consumers' individual preferences. When implemented well, personalization helps you create brand interactions that are meaningful to each and every customer.

# Chapter 4: Your Brand and Personalization



There are many ways you can personalize your online store. As we've already discussed, most of them focus on improving the relevance of recommendations and promotions. The key differentiator is how you choose to deliver that.

What steps can you take now to deliver the best experience for shoppers, and how can you prepare for an even more powerful, personalized future?

## Push Your Omni-channel Strategy Further

What's the only thing better than a great personalized experience?

A seamless omni-channel brand experience, that brings a deeper level of automated, individual customer care to all of your channels and platforms.

Personalizing the customer journey — from social media engagement to online research, customer reviews, product search, and through to making a purchase or returning an item — means introducing new tools to every channel you operate on.

It's a big task, but it will pay dividends in the long run. After all, making customers feel cared for in all the interactions you have with them is how you achieve an outstanding customer journey that they return to, again and again.

## Be Part of an Ecosystem

If you want to offer a truly personalized experience, then it needs to be delivered where customers are. You might have the best website ever, and still be missing out on shoppers who make the majority of their purchases across other platforms. To sell to customers of the future, you need to be part of the ecosystems they use to shop.

This is bigger than a multi- or omni-channel strategy, because it combines experiences that

are owned and operated by many different providers. To make a single purchase, a customer may use a smart home device, and the apps they use to do it need to be searchable with voice recognition software. So a brand that wants to sell on smart devices needs to be part of the ecosystem that allows consumers to reach them through this medium.

There's no single way to do this, and the approach you take will depend heavily on the shopping habits of your customer base. But it's important to go about it the right way for your business. Being part of the right ecosystem(s) means your customers can easily and quickly find you.

To pull this off, you'll need to consider partnering with businesses offering relevant e-commerce tech solutions. To use the example we gave above, if you want your products to be searchable on smart home devices, you need to work with the manufacturers and make your brand compatible.

Sales that move through ecosystems don't yet take up an enormous market share, but at 10%, it's still significant. And McKinsey predicts it will grow to 30% by 2025.

## Use Deeper Insights to Discover New Opportunities

The tech that drives personalization is the same as the tech that can tell you how to use it. As we explored earlier, this is because knowing how these tools work helps you understand their capabilities and limitations. When you know what is and isn't possible, you can create a better strategic roadmap that really works for your business.

And the best way to make sure you stay on track? Data, data, and more data. Thanks to ML, discovering opportunities for growth is easier than ever. Plus, many personalization solutions have analytical tools built in, so it pays to learn how to use them optimally.

Because most AI programs come up with their own data categories, the analytics gained can

easily identify new opportunities for anything related to personalization, including:

- **Merchandising and product recommendations**

Deeper customer insights can help you develop far more relevant campaigns than was previously possible.

- **User experience**

It can be hard for humans to identify which parts of the user experience need improving; different customers will respond to different things. Data collected from analytical tools will help you figure out how you can tailor the user experience in a way that caters to customers' different styles of interaction and shopping behavior.

- **Customer journey**

There are many different platforms and ways you can deliver an experience to your customers. How do you decide which ones are right for your business? Data of course!



## Supercharge Your On-Site Search

Great search can be the difference between a sale being made, and a missed opportunity. This is an area that the team here at Klevu specialize in. Our search engine uses advanced ML to learn what your customers want and need, helping them find exactly what they're looking for.

We use rich autocomplete to display your products visually, in real-time, before your customers even finish typing in the search bar. Our category navigation is personalized, too, giving your customers an intuitive and richly rewarding experience.

And it works. One of our customers, Bathroom Takeaway, were finding that their users would frequently abandon the product search. Klevu Search helped them transform their user experience, after which they saw a 66.58% increase in revenue in the first 4 months.

At Klevu, we give merchants the tools for amazing personalized customer search and site navigation, and we're working hard to make the

tech behind our engine even more powerful and personalized in the future. If you'd like to find out more about how search can boost your sales and help your business grow, [schedule a demo.](#)

# Chapter 5: Conclusion

So what have we learned? In this ebook, we've discussed the history of personalization. What it is, and how the technology that drives it is working to create a deeper experience that's more responsive to shoppers' wants and needs. We've spoken about how this technology will improve over time, and why you would be wise to prepare for an online retail landscape that continues to be increasingly geared towards customers as true individuals, rather than groups of people.

We've also given you a few ways you can prepare for this future, and introduced you to our own search-based solution. Applying what you've learnt in this ebook will help you in three key areas:

1. You'll feel more confident when you need to [vet personalization solutions](#) from potential vendors. A basic understanding of the tech behind it, and its applications, means you can critically analyze the promises of success.
2. When you've implemented the right personalized strategies for your business, it will greatly improve the user experience for your customers and drive conversions.

3. This boost in customer satisfaction will improve brand satisfaction, too. Over time, you'll be able to grow a base of loyal, returning customers who love your brand. Perhaps they'll even become brand advocates?

And there's no need to tell you that customers who stick around, and higher sales figures, will help your business to grow and thrive!

*Want to learn more about personalization and marketing in the e-commerce sector? Check out our previous articles on our [blog](#), and to find out how Klevu smart search solutions could help your business grow, [schedule a demo](#).*



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