THE MARKETER'S GUIDE TO:

Machine-Learning vs. Rule-Based Personalization

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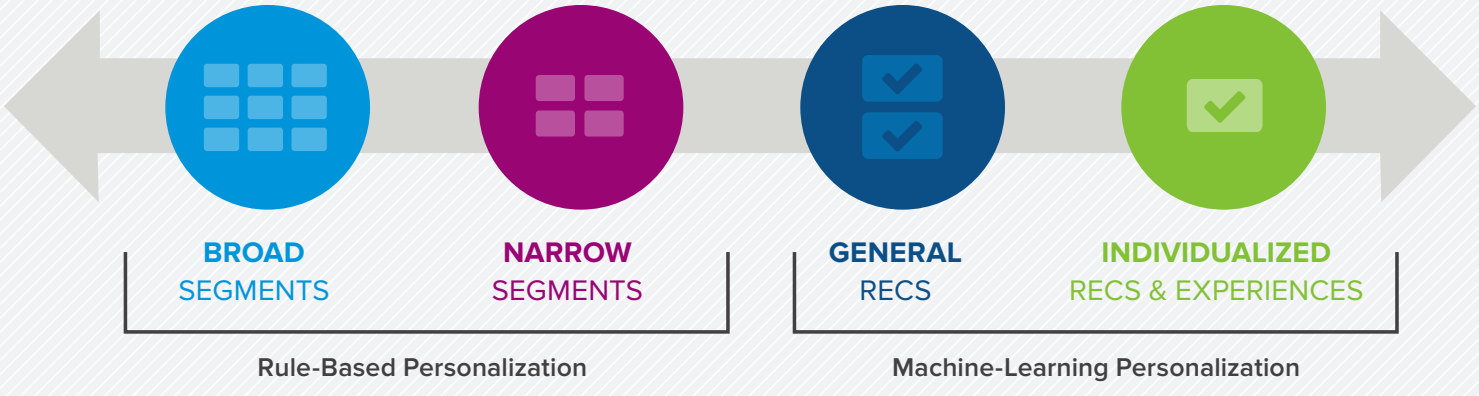
Machine-Learning vs. Rule-Based Personalization

Personalization across your digital properties can take many forms. It can range from simple campaigns like a "welcome back" message to all return visitors, to more advanced techniques like individualized product recommendations based on a shopper's unique tastes.

These two examples, and all forms of personalization in between, can deliver significant value to your visitors and customers. One type of personalization is not inherently more valuable than any other — the key is in **matching the strategy to the goal** to ensure that you are getting the most out of your personalization efforts.

At the heart of any personalization strategy are rules and machine-learning algorithms. While machine-learning personalization is growing in usage and popularity, rule-based personalization remains a powerful tool to provide experiences to groups of people with similar characteristics. The personalization spectrum varies from rules that govern broad segments, to individualized experiences driven by machine learning.



Whether you're just getting started with personalization, or you're looking to take your personalization strategy to the next level, you need to fully understand the use cases for both rules and machine learning. This eBook will explore various use cases to provide you with a solid foundation to help you reach your personalization goals.

CHAPTER 1: RULE-BASED PERSONALIZATION

WHAT IS IT?

Rule-based personalization allows marketers to deliver experiences to specific groups or segments of people based on the manual creation and manipulation of business rules.

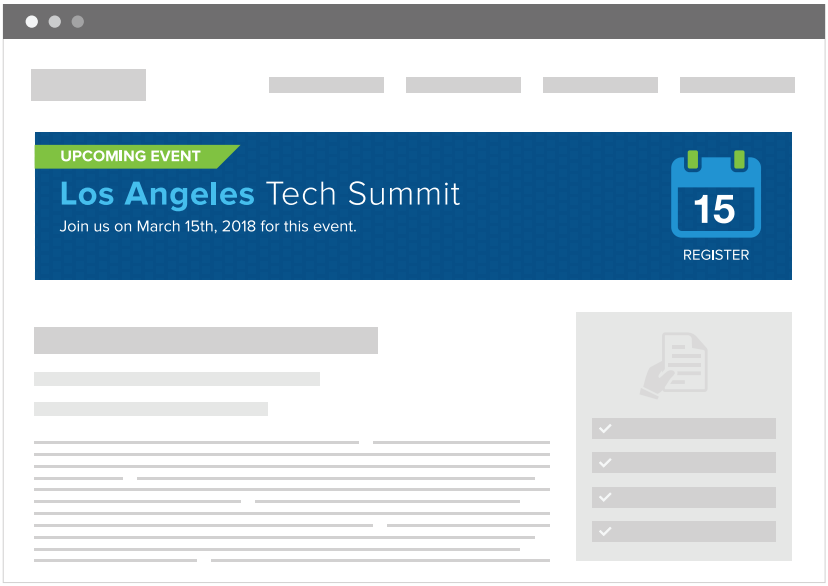
As the definition above suggests, segments form the foundation of rule-based personalization. Segments allow you to categorize a subset of your website visitors or app users according to their attributes and behaviors, and then use rules to customize the experience for each segment.

The simplest way to think about rule-based personalization is in the form of IF/THEN statements:

IF a person falls into segment A, THEN show him experience X. For example, IF a visitor comes from California, THEN show her a message about an event in the area. IF a visitor is a member of your loyalty program, THEN provide a message welcoming him back to your website.

IF	THEN

IF a visitor comes from California, **THEN** show her a message about an event in the area



Creating Segments

As long as you can collect the data for it, you can create a segment against it. The segments you create will depend entirely on your business and your specific goals. For example, a travel company may want to speak differently to its website visitors from different regions of the country, but a software company may not find any value in segmenting visitors by geolocation. That software company may want to focus on the industry of its visitors instead.

Segments can be created based on any identifiable attribute or behavior. To help you understand the different types of segments that can be created, let's dive into attributes and behaviors.

Attributes

Attributes describe any intrinsic characteristic of a visitor. They can be derived from two key sources:

Web Attributes

These attributes are detected as soon as a person lands on your site. Examples include geolocation, industry or company (based on reverse IP address lookup), time of day, and source (such as search, email, social, paid ad, etc.). These attributes are particularly valuable in helping you personalize an experience for first-time visitors that have not yet interacted with your site, although they can be used in many other situations as well.

Database Attributes

These attributes are not detected from the web, but rather are pulled in from a database-driven system such as a CRM, email marketing solution or a data warehouse. They can include anything that you store in one of those systems, such as whether the visitor is a prospect or customer, a high-value customer, in a particular category, etc. Note that in order to tie a website visitor to data in another system, you need some kind of identifier (such as an email address) for that visitor.

Behavior

Behaviors describe any action taken on your website or app. As visitors engage with your digital property, you can alter their experiences based on actions they have taken in the past or in their current sessions (or both). Behaviors can be broken into three main buckets:

Site-Wide Behavior

Simple behavioral analytics such as number of visits to your site, average time on site, visit recency, etc.

Page Visit Behavior

Data about specific page views for an individual, such as which pages he or she has visited and the number and frequency of visits per page.

Deep Behavior

This considers in-page context (e.g. category, tags, brand, style, etc.) and level of engagement for an individual based on mouse movement, scrolling, inactivity and time spent per page to provide the most accurate indication of affinities, interests and true intent.

Broad vs. Narrow Segments

Broad Segment Narrow Segment

A segment created using just one or two of these behaviors or attributes would be considered a **broad segment**. For example, an online apparel retailer can personalize by geolocation, showing everyone in a certain region the clothing and footwear appropriate for their climates. A B2B site could recognize a visitor's business type to orient the content they see around industry-specific case studies.

Segments that begin to combine multiple behaviors and attributes are **narrow segments**. They often leverage nested "AND" and "OR" logic to create very specific groups of visitors. For instance, the clothing merchant could recognize a repeat visitor from Florida who originated from a specific ad campaign type and point him to the "sun-lovers" sale merchandise that he has engaged with in the past. The B2B tech company site could recognize prospects from the financial services industry that have already spent a certain amount of time exploring particular product pages, such as network servers, and promote a relevant white paper.

Arrived via "Sun" Ad Campaign

OR

Located in Florida

AND

Has visited 2+ times

B2C EXAMPLE

Segment of repeat visitors from Florida or who arrived to site from specific ad campaign

In Financial Services Industry

AND

Spent > 1 min on network server pages

AND

Has not viewed whitepaper

B2B EXAMPLE

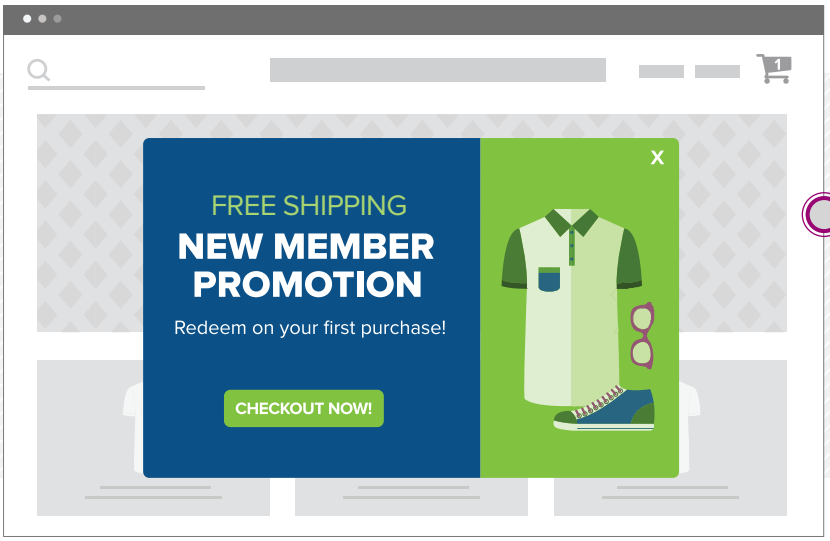
Segment of visitors from financial services industry interested in network servers who haven't viewed a whitepaper

Marketers need to weigh whether the effort to design an experience for a very small group of people is worthwhile. In some cases this will be appropriate. For example, if you are implementing an account-based marketing (ABM) strategy, you want to create highly tailored communications to reach specific accounts. However, in other situations, machine-learning personalization may be a better fit. This will be explained in more depth in the next chapter.

Designing Experiences

Once your segments are created, you can design specific experiences to deliver to those segments via rules. There is a vast spectrum of rule-based experiences you can provide, ranging from the very simple to the very complex.

Callouts, infobars and pop-up messages are typically easy campaigns to deploy with rules. They are a great place to begin your personalization journey and generate some quick wins.

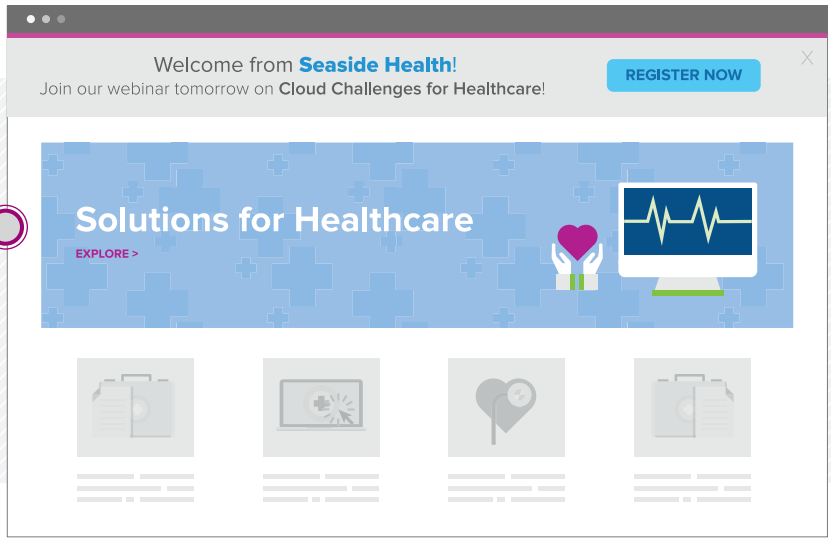


B2C EXAMPLE

A retailer can create a message that only displays to first-time visitors to introduce the site and offer a promotion.

B2B EXAMPLE

A software company can promote a webinar only to known visitors that have been to specific pages of the website.



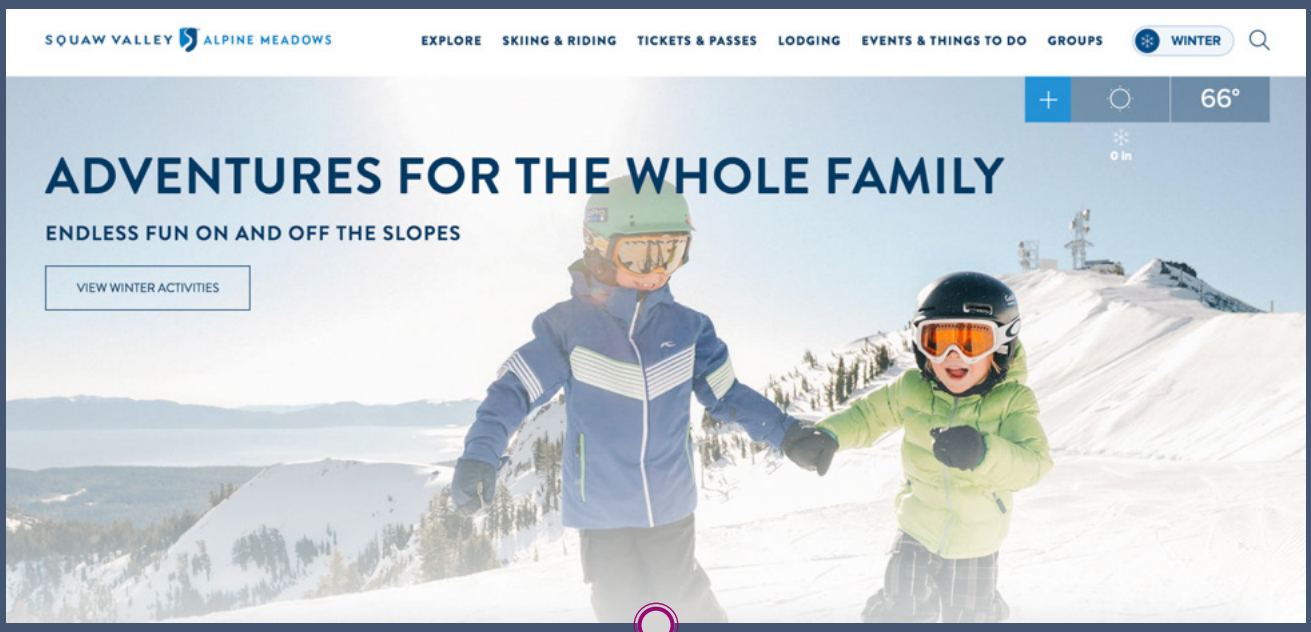
In the previous examples, it's easy to see that pop-ups, callouts and infobars overlay the content on the page, interrupting the site experience. While these types of messages are typically successful at catching the attention of your audience, you don't want to overuse them as they can be annoying. Most of the time, you'll want to provide more subtle personalized experiences. For those occasions, you can add, remove or replace content within the page itself with in-line content or in-page edits. When you modify the content within a web page in real time, your visitors will generally not even notice that personalization is taking place.

In-line and in-page changes can be leveraged across your site. Let's look at some real-world examples for B2C and B2B companies.

Squaw Valley Alpine Meadows & Persona-Based Marketing

Squaw Valley Alpine Meadows (SVAM), a mountain resort in North Lake Tahoe, California, leverages persona-based marketing on its homepage. Key groups, like families, are placed into segments based on the content they explicitly engage with on the site or the group with which they self-identify. Once a visitor falls into one of these key segments, he or she is provided with a homepage experience relevant to that segment.

Using this persona-based approach to deliver targeted content, its high-value "family" segment realized a **38% increase** in conversion rate and a **41% lift** in revenue per customer.



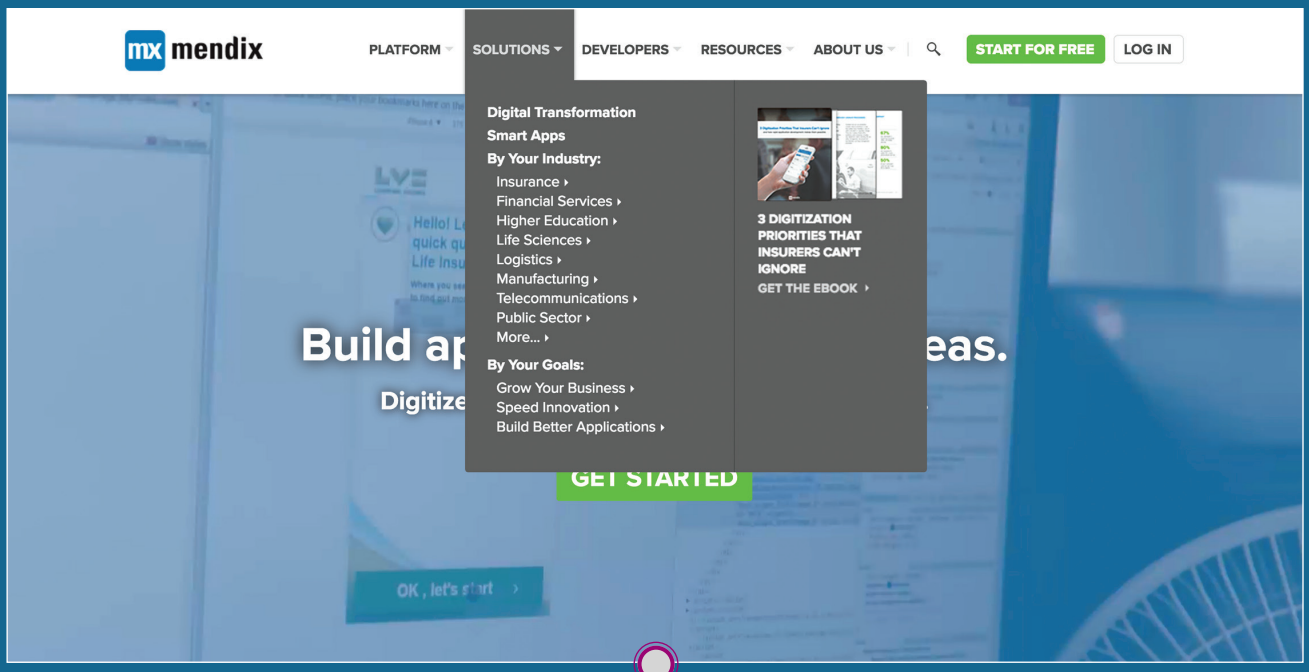
B2C EXAMPLE

Squaw Valley Alpine Meadows uses rules to personalize its homepage experience to different personas and geolocations.

Mendix & Account-Based Marketing

Mendix, a leader in the emerging application Platform-as-a-Service (aPaaS) market, incorporates personalization in its ABM strategy. Using IP lookup to identify a visitor's industry, visitors are shown a promoted piece of content based on their respective industries directly in the navigation of the site.

After implementing personalization across its site, Mendix saw a **10% lift** in content downloads and saw its homepage bounce rate drop by **6%**.



B2B EXAMPLE

Mendix uses rules to personalize the suggested content within its site navigation as part of its ABM strategy.

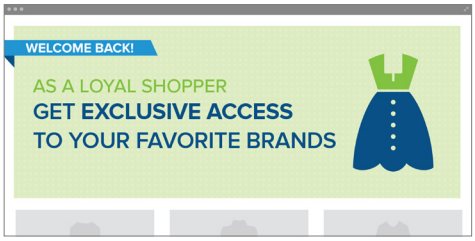
Prioritizing Experiences

An important final consideration for rule-based personalization is that you will want to be able to prioritize experiences for different segments. Let's say that you have multiple different experiences, and you want to target them to different segments of visitors, but it's possible for a person to fall into more than one segment. A robust solution should allow you to prioritize one experience over another to show the preferred experience to the visitor. It should also allow you to specify when and whether the other experiences should subsequently be shown as well.

For example, let's say that a retailer wants to tailor a section of its homepage to different groups of visitors: high-value customers, first-time visitors, and visitors who regularly shop for dresses on the site. But it's possible for a visitor to be a regular dress shopper and a high-value customer. The retailer could prioritize the experiences. In this case, the retailer may choose to set up the following prioritization rules:

FIRST TIME VISITOR
If the visitor is a first-time visitor, show her the first-time visitor welcome message.

RETURN VISITOR
If the visitor is a return visitor and a regular dress shopper, show her the dress promotion message.



RETURN, HIGH-VALUE CUSTOMER
If the visitor is a return visitor, a regular dress shopper and a high-value customer, show her the welcome back customer incentive message.

OPTIONAL ADDITIONAL STEPS
If the same high-value customer clicks through on the incentive message, don't show her any more messages. If the same high-value customer does not click through on the incentive message after two impressions delivered, then show her the dress promotion message.

Wrap-Up: Rule-Based Personalization

These are just a few brief examples, but the opportunities for using rule-based personalization on your site are numerous. These examples have focused on website experiences, but rules can be leveraged in your mobile app, web application and even your email campaigns. Before you begin, think about your site visitors, app users or email recipients and determine the variables that meaningfully differentiate their needs. Then design experiences that provide relevant information to those segments of people in order to better engage them.

And don't forget to A/B test each new experience you design to determine if it is successful based on the engagement and conversion goals you're looking to achieve.

DEFINITION

Rule-based personalization allows marketers to deliver experiences to specific groups or segments of people based on the manual creation and manipulation of business rules.

PROS

- Rules allow you to speak differently to specific groups of people when it's appropriate
- Segments are easy to understand and set up

CONS

- Creating separate experiences for each segment is a manual process
- Designing experiences requires you to pick segments to focus on

IDEAL USES

- Any segment-based communications or experiences, such as persona-based marketing, account-based marketing, communication based on visitor source, etc.

NOT IDEAL FOR

- Product or content recommendations
- Individualized experiences

CHAPTER 2: MACHINE-LEARNING PERSONALIZATION

WHAT IS IT?

Machine-learning personalization utilizes algorithms and predictive analytics to dynamically present the most relevant content or experience for each and every visitor.

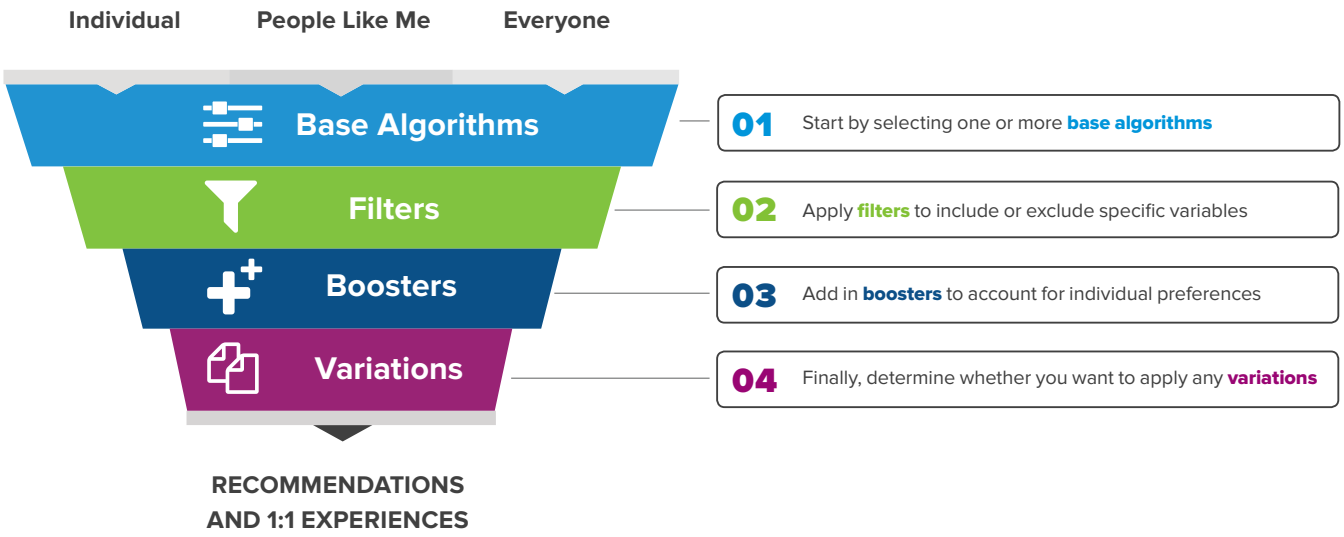
Machine-learning personalization provides a more scalable way to achieve unique experiences for individuals, rather than segments of people. It allows you to utilize algorithms to deliver these one-to-one experiences, typically in the form of recommendations for products or content. That said, with a next-generation platform, machine-learning personalization can also be applied to recommending categories, brands, offers and more, as well as dynamically modifying site navigation, search results and list sorting.

The Most Relevant Experience for Every Visitor

Popularized by household names like Amazon and Netflix, algorithms aren't just for giant e-commerce companies. They can be utilized by marketers from companies of any size.

Building Algorithms

While slightly more complex than rules, algorithms can be created and managed by the marketer with the right solution. To begin, it helps to understand what makes up a recommendation algorithm.



Let's walk through each of these in more depth. Note that in these sections we will be speaking about product recommendations for consistency, but content recommendations and other one-to-one experiences leverage the same principles.

Base Algorithms

Base algorithms are the foundation for delivering recommendations and individualized experiences. Here are a few of the most commonly used ingredients:

Basic Algorithms

Trending

Items are recommended based on what is most popular on the site during a specific time period.

Recently Published

Products are recommended based on what has recently been added to the site.

Soon to Expire

Items that are recommended are prioritized based on their upcoming expiration dates.

Co-Browse

Items are recommended based on what other people on the site have also viewed.

Co-Buy

Items are recommended based on what other people on the site have also purchased.

Similar Items

Items are recommended based on similarity in product type or category.

Advanced Algorithms

Collaborative Filtering

Based on a visitor's engagement with different items, he is grouped into a cluster of people with similar likes and dislikes. Items are then recommended by comparing him to others in his cluster to predict what he may like. (Netflix, for example, uses this technique.)

Predictive Segments (Automatic Clustering)

Automatically identify clusters of visitors with similar behavior and affinities. Highlight the differences in conversion and behavioral statistics between clusters to enable more relevant recommendations and targeting.

Random Forest (Decision Trees)

Detect the best converting paths, actions and content for influencing an individual's journey towards conversion. Show them the right next step at the right time.

Contextual Bandit

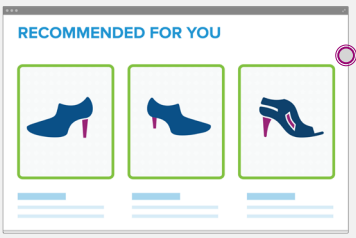
Using explicit, known visitor data, select best converting offers and promotions even before a user demonstrates interest through behavior.

Text Analysis

Utilizing Natural Language Processing (NLP), determine the strongest keywords within the text-based content a visitor consumes to use for personalized experience delivery.

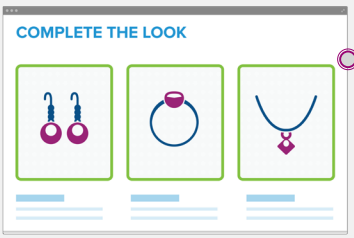
Filters

After you've picked a base algorithm, you can customize it by including or excluding certain criteria using filters. Filters allow you to exercise more control over the categories, brands, price ranges, locations, etc. that are shown in your recommendations.



INCLUDE

A retailer may want to apply a filter to include the same category a shopper is viewing.



EXCLUDE

Alternatively, a retailer may want to exclude the category a shopper is viewing.

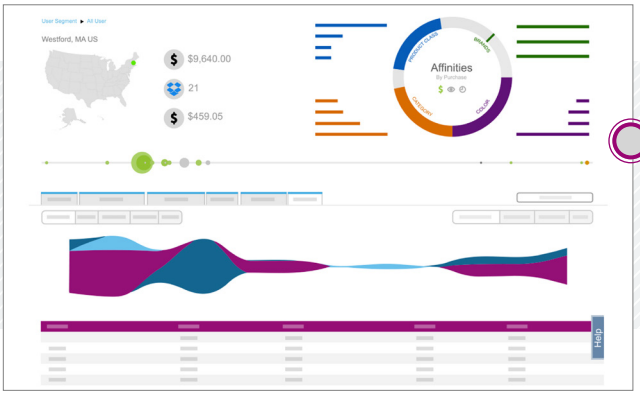
One reason you may want to apply a filter is to better tailor your recommendations to your shoppers. For example, a retailer may want to use the recommendations on its product detail pages (PDPs) to help shoppers find other products in the category they are browsing. So while browsing shoes, the retailer may want shoppers to only see recommendations for other shoes. In that case, the retailer would apply a filter to only include the same category.

Other retailers may decide to use PDP recommendations to drive upsells, such as recommending jewelry and other accessories to "complete the look" while a shopper is viewing a dress. In this case, the filter would exclude the category of the product being shown.

You can also use filters to apply restrictions for business reasons. For example, a retailer may wish to exclude brand A from the product pages of its rival, brand B, due to the request of the manufacturer. In that case, products from brand B will not be shown in recommendations on product pages for brand A, or vice versa.

Boosters

After you've selected the base algorithm(s) and excluded or included certain criteria, you can choose to boost certain affinities. Boosting allows you to incorporate and prioritize the specific preferences in brand, category, price range, color, gender, etc. of each individual on your site. These preferences can be determined with deep behavioral tracking on each individual — incorporating not just what a visitor clicks on, but also mouse movement, scrolling, inactivity and time spent per page to give a clear indication of preference and level of interest.



PREFERENCES FOR EVERY INDIVIDUAL

When you are able to track behaviors at a deep level on your site, you can uncover the individual preferences and affinities of each shopper to "boost" them in your algorithms.

There are many different ways in which boosters can be applied to completely individualize your recommendations. They can ensure that a person's favorite brands are prioritized across your site, that her preferred colors are shown most often, that she sees recommendations within her preferred price range, etc.

Using Boosters and Filters

It's worth noting that boosters and filters may seem very similar, because you use them to account for the same variables (such as brand, category, price, etc.), but there are clear differences. Filters allow marketers more control over what types of products to show, while boosters allow marketers to individualize those products. Let's walk through an example.

Many clothing retailers offer products across different categories (e.g. men, women, kids). One of these retailers may choose to apply a category **filter** to recommend only other items on a PDP that are in the same category as the one being viewed. In that case, while viewing a woman's shirt, the shopper would only see recommendations for other women's clothing, never seeing any men's or kids' products. In this case, you can see that the filter refines the products being recommended.

In this same example, adding a **booster** can further individualize the women's shirts being recommended. For example, adding brand and color boosters will enable the recommendations to leverage this visitor's brand and color preferences, and recommend women's shirts in her favorite brands and colors.

Whether you choose to apply filters, boosters, or both is completely dependent on your goals and the needs of your specific visitors. Generally speaking, however, the more you can individualize your recommendations with boosters, the more effective they will be. But you should always test out your ideas!

Variations

Finally, you can decide to include some variations in your algorithms. These can take several forms. For example, you can set your homepage recommendations to be randomized (while still being relevant to each individual) so they stay fresh, or you could cap the number of times you show a recommendation to a person to minimize apathy.

General vs. Individualized Recommendations

General Recs Individualized Recs

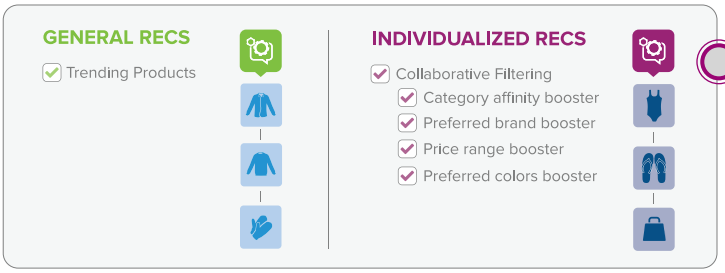
You can apply algorithms to produce both general or individualized recommendations.

General recommendations are based on site-wide browsing and purchasing behaviors – using simple "base algorithms" and sometimes "filters" – without factoring in anything specific to the individual.

For example, a retailer using general recommendations may recommend sweaters and other winter wear in February because cold-weather products are trending on the retailer's site. And a B2B company might recommend its most popular blog articles or eBooks. Although this "wisdom of the crowd" approach provides a good starting point for recommendations, it's not as effective as a one-to-one approach.

For truly **individualized recommendations**, marketers can take everything they've learned about each visitor and factor in their intent in real time — leveraging machine-learning algorithms and "boosters" to make the recommendations or experiences highly specific.

Leveraging a machine-learning algorithm such as collaborative filtering, an online retailer can deliver 1:1 recommendations by understanding the visitor's true intent based on the categories, brands and styles she prefers. So if it is February and a visitor from Florida is searching for swimwear, sweater recommendations wouldn't be particularly effective or relevant. Based on her demonstrated interests (and disinterests), the algorithm could recommend other swimwear and even suggest products from related categories such as cover-ups and flip flops to complete her look. And on a B2B site, if a customer has spent a lot of time reading about network servers, he could receive individualized content recommendations based on this topic affinity, excluding items he's already consumed.



B2C EXAMPLE

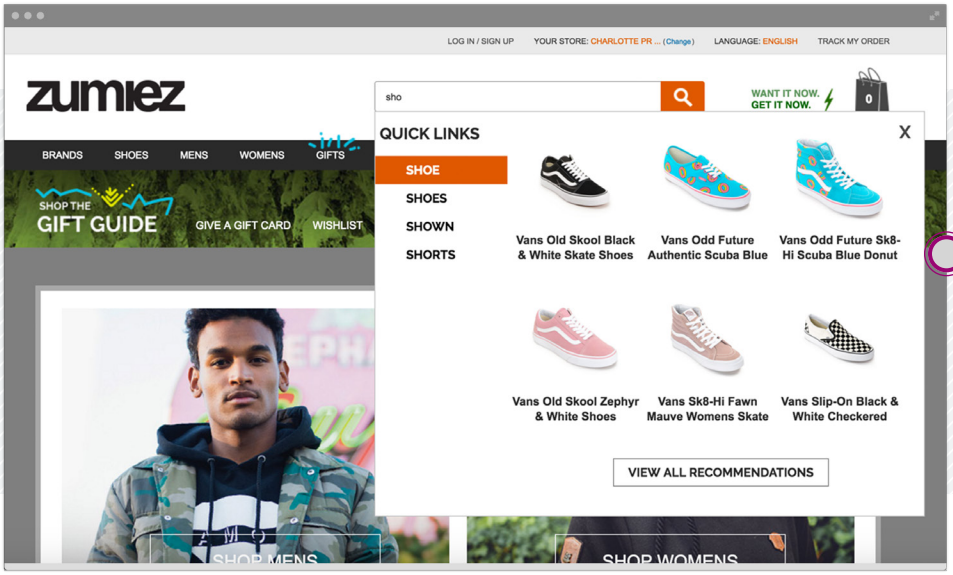
A retailer could show trending products to the shopper, or it could show more individualized recommendations that consider the category, brands, colors and price ranges she prefers.

Placing Recommendations

Once you have created and customized your algorithms, there is no limit to how and where you can use them for delivering recommendations and experiences.

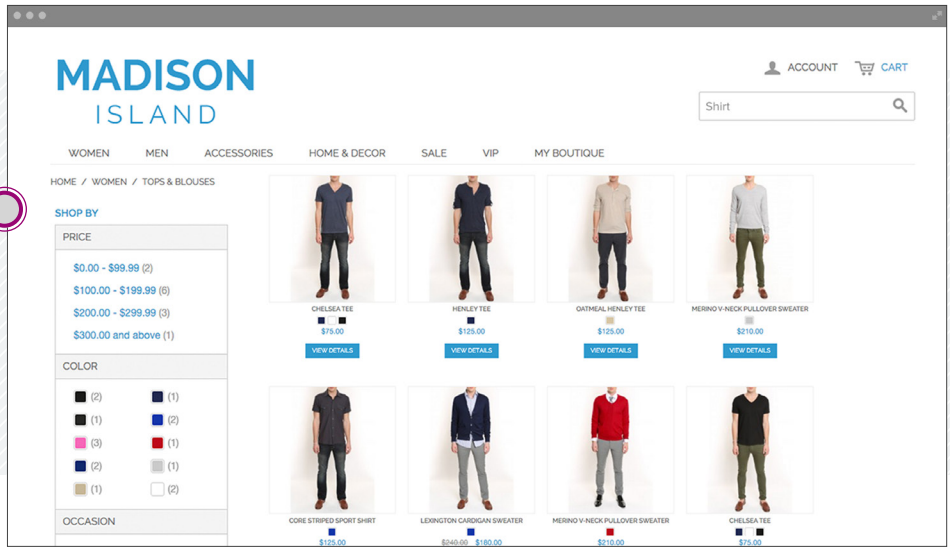
PLACEMENT IDEAS

- Homepage
- Product detail pages
- Category pages
- Articles
- Checkout pages
- Search bar and results
- List views
- Main or in-page navigation
- Emails



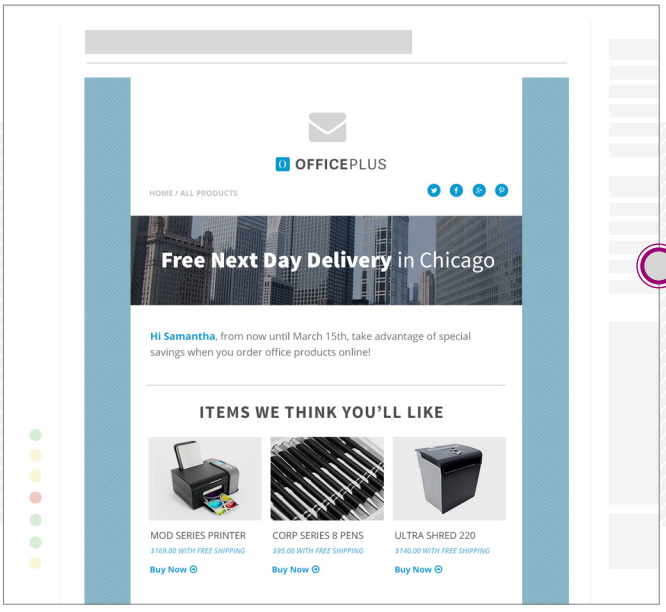
SEARCH BAR

Algorithms can be used to place recommendations of products or content directly in the search bar itself.



LIST SORTING

Algorithms can be used to sort lists to include the most relevant options first.



EMAIL PRODUCT RECS

Algorithms can be placed in emails to send customers individualized recommendations that are updated at open time.

Don't forget that the format of the recommendations in each of these locations does not need to be fixed either. Stack images on the left or right side of the screen. Place them in a grid or in a carousel (or a series of carousels). There is no limit to what you can try. You should regularly test your algorithms and recommendation styles and placement to determine what works best and what needs tweaking to optimize clicks, engagement, downloads and/or purchases.

Wrap-Up: Machine-Learning Personalization

Note that the examples in this section have all focused on product recommendations for consistency, but algorithms can be used in an endless number of different ways across industries. They can be used to determine the categories you display on your homepage, your site's navigation, the order in which items are sorted on a page, the content you recommend across your site or in your emails, and more. Essentially, machine-learning algorithms can be used to drive your entire website experience to make it unique and relevant for each individual. The applications and manifestations of machine-learning personalization are only limited by your imagination.

DEFINITION

Machine-learning personalization utilizes algorithms and predictive analytics to dynamically present the most relevant content or experience for each and every visitor.

PROS

- Allows you to deliver one-to-one content to every visitor
- Allows you to add personalization to your site/app quickly and let it run automatically
- Requires little manual intervention compared to rules

CONS

- Involves somewhat more complicated concepts to understand than rules
- Requires strategic thinking and a powerful platform to select, customize and test algorithms

IDEAL USES

- Product or content recommendations
- Individualized experiences

NOT IDEAL FOR

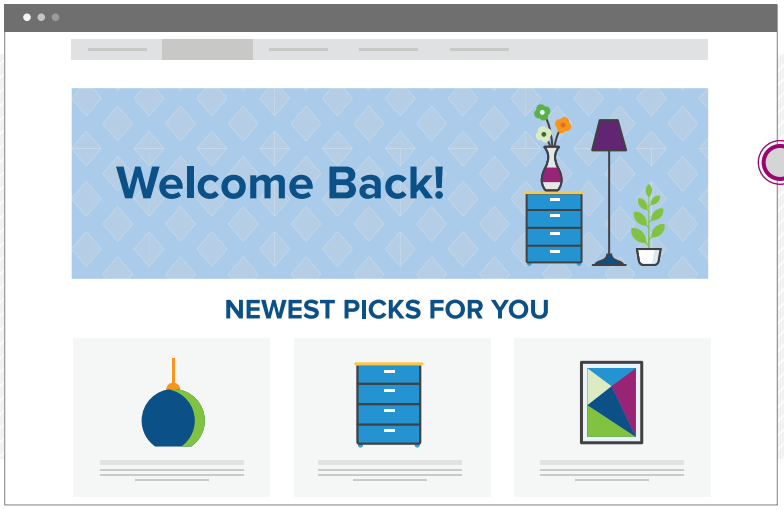
- Segment-based communications or experiences

CHAPTER 3: COMBINING RULES AND MACHINE LEARNING

As we stated at the beginning of this eBook, the key to leveraging rules and machine learning is matching your strategy to your goals. Rules and machine-learning algorithms are both powerful personalization techniques, and each has its own separate strengths and benefits.

However, very importantly, rules and algorithms can be used together to make the most of those strengths.

For example, on your homepage, you can create a rule-based hero experience (similar to ones that we showed earlier in the eBook) to tailor your site to different segments of visitors. Then you can add a section for one-to-one product recommendations on the same homepage to facilitate product discovery.



BLENDING RULES AND ALGORITHMS

A strong personalization strategy uses both rules and algorithms.

Here, a rule is used to display a welcome message to a repeat visitor, while an algorithm is used to display individualized product recommendations.

You can also go further and use rules and machine learning in the same personalized area of your site. One great example of this is showing product or content recommendations to a particular segment of visitors. You could use a rule to identify returning visitors to your site, and then show only that group of visitors recommendations of new products that match their individual preferences and have been added to the site since they last visited. In this case, first-time visitors would see a completely different experience, possibly a different section with a different recommendation algorithm, to show them something more relevant.

START PERSONALIZING TODAY

Once you have identified the strengths of rules and machine-learning personalization and recognize their ideal use cases, you can leverage them effectively to reach your digital marketing goals. By combining rules and algorithms in creative ways, there is an unlimited number of personalized experiences you can create. All you need is the right platform to give you complete control and flexibility over the segments you build, the rules you create, and the algorithms you design.

Once you have the right solution and the know-how to get started, there's nothing stopping you from designing experiences that dramatically improve engagement, boost conversions and build loyalty.

The examples of rule-based and machine-learning personalization outlined in this eBook are easy to create with a best-in-class solution like Evergage.

About Evergage

Evergage's real-time personalization platform delivers The Power of 1, enabling digital marketers to transform the dream of 1:1 customer engagement into reality. Combining in-depth behavioral analytics and customer data with advanced machine learning, Evergage provides the one platform you need to systematically understand and interact with each person that visits your site or uses your app – one at a time, "in the moment" and at scale – to deliver a maximally relevant, individualized experience.

Contact Evergage at **888-310-0589** to speak to an expert about your needs today!

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