

Episerver White Paper

AI and the Customer Experience
Revolution



Executive summary

- Corporate investment in artificial intelligence is skyrocketing, forecast to reach \$12.5 billion in 2017.
- AI and machine learning enable personalization at scale, breaking through the segmentation ceiling.
- AI-driven insights from omnichannel customer data can improve decision-making, inform campaigns and shape strategy.
- Real-time personalization improves the customer experience and is welcomed by users.
- Predictive capabilities are already being used to accelerate consumers' progress through the purchase funnel.
- Identify the most promising use-cases for your organization. AI can then be deployed quickly and strategically for rapid returns.

Experiences that match expectations

It's all about the experience. From bootstrapped start-ups to the largest enterprises, companies across digital commerce are seeking to gain a competitive edge through a better customer experience.

But as fast as companies can chart a new course, the destination itself has a nasty habit of disappearing over the horizon. An intuitive user experience and slick interface is rarely a point of difference. Even a genuinely seamless omnichannel proposition – as unusual as it is – may not suffice, thanks to the bar-raising efforts of Amazon, Airbnb, Uber and others. Innovation and digital transformation in one sector swiftly become the benchmark in another.

Big players set standards but consumers set expectations, and these race far ahead of many companies' capabilities to deliver.

And while consumer expectations are hard to measure, behavior is not. Bounce rates, abandoned carts, open and click-through rates, Net Promoter Scores... the metrics and pain points are visible to every digital marketer and merchandiser. Little wonder that customer behavior and preferences are the key drivers of digital transformation for 55 percent of companies.¹

The challenge is that fickle consumers are increasingly expecting that the digital experience is also personalized. Personalization is swiftly becoming a defining feature of a modern user experience, and getting it right brings its own rewards: brands that personalize increase revenues by two to three times their non-personalizing competitors.²

The search for relevance

Personalization is the pursuit of individualized relevance, and in that sense it's nothing new. Personas, customer journeys, segmentation, rules and automation are all well-trodden routes used by marketers to find commonalities and create a [somewhat] tailored experience, and the consequent boost in engagement and revenue is well-established.

But these techniques simply won't scale. As the customer base grows, they don't adequately scale up: an increasingly large and diverse customer base is ill-served by broad segments and manually implemented rules. And they don't scale down – for any given individual, personalization is partial, inaccurate or wholly missing.

Segments of one – individualized experiences that draw on profile and behavioral data, but are also shaped by the profiles and actions of others – can never be delivered at scale by humans. That's when marketers and merchandisers must turn to artificial intelligence.

¹ eMarketer.com

² Boston Consulting Group

Introducing artificial intelligence

Artificial intelligence (AI) is a broad and rapidly evolving field of computer science. But without context, the term AI is meaningless. It might mean the development of technology that could herald the salvation (or destruction) of mankind. Or it might be a better way to sort garbage, or have fun with chatbots. To discover the transformative power of AI for digital commerce, we need to zero in on the relevant capabilities.

AI is the recreation of cognitive functions in computers; it enables machines to perform tasks like humans, and perhaps even better than humans. It's long been a source of fascination in popular culture, giving rise to Hal 9000, C-3PO, Agent Smith from The Matrix and Skynet, among others. In the real world, scientists and futurologists contemplate the technological singularity, in which a superintelligence emerges with untold human consequences. While undoubtedly fascinating, this is the realm of generalized AI – and is definitely not here now.

Professionals in many industries are intensely interested in the specifics of what AI can do today, and how can it help. They're considering the impact of applied AI, in which computers are used to address a particular problem, extracting and utilizing patterns found in large volumes of data. Of all AI's subfields, machine learning is attracting the most attention.

AI in your pocket

Your smartphone is buzzing with the fruits of the last three to five years' AI and machine learning research: Siri, Google Now, Alexa or Cortana, music and news recommendations, social feeds, speech, text and music recognition and many more. There are valuable applications of the technology in many other spheres, too, from fraud detection to medical diagnosis.

Machine learning is itself an umbrella term for different types of learning, and can be accomplished using different techniques. For the uninitiated this is a minefield of jargon, with vendors promising to synthesize vast pools of customer data using "black box" or opaque AI technology. This has led to a perception that all marketing teams should "have AI" and that AI is the magic bullet, resolving all pain points and unlocking a unified personalized customer experience.

Reality check

As far ahead as we can predict, AI and machine learning can never be that panacea. Furthermore, over the same time period – and in contrast to predictions for roles in many industries – AI will not take the place of marketers and merchandisers themselves (although it is already lending new value to analytical and strategic marketing skills).

The reason? **While AI is stupendously good at making sense of data, it struggles with context.** Only humans – preferably experienced, well-informed humans – can understand the full context of their customer journeys and decide how to design or reengineer them. AI gives these professionals the means to do this better, and then maximize relevance through real-time customization of the user experience.

How AI can transform your experiences

Corporate investment in AI is skyrocketing, forecast to reach \$12.5 billion in 2017 (up over 50% on 2016).³ Insights-driven businesses are forecast to take \$1.2 trillion in revenue from those that are not by 2020.⁴ As ever, senior decision makers need to be informed, decisive and results-oriented – or risk losing out. Harvard Business Review puts it starkly: “Over the next decade, AI won’t replace managers, but managers who use AI will replace those who don’t.”⁵

The opportunities in digital commerce are numerous. Seen through the right lens, AI and machine learning are the most exciting developments in marketing and merchandising for decades and present the opportunity to:

- Break through the segmentation ceiling
- Make better decisions through trend and cluster analysis
- Discover (and capitalize on) product associations
- Deploy product and content in mutually reinforcing combinations
- Increase customer engagement and satisfaction in real time.

The key attraction in digital commerce circles is that machine learning, as its name implies, is designed to be self-optimizing. Optimizing for revenue, for example, will surface an increasingly profitable selection of products (within the brand parameters selected).

Understanding how AI is working here is less important for marketers than a grasp of when to apply AI capabilities, and what value AI is delivering for customer and company alike.

Unlike any technology before it, AI’s analytical and predictive capabilities offers the prospect of reducing friction in the present but also in the future, for each and every individual. It can maximize real-time and latent engagement. To get this right requires a data-driven, strategic approach to personalization, one that cuts across channels and connects existing silos.

But personalization is a journey, not a destination, and in many cases it can start with a surprisingly small step. Lack of a roadmap is one of the most oft-cited obstacles to personalization⁶, but AI can often be put to work in weeks rather than months and years.

Effective, tailored AI technology, such as that embedded across the Episerver Digital Experience Cloud™, is available now. And once integrated, AI starts learning and delivering incremental value from day one. This white paper will help you discover all the ways in which AI could transform the digital experience for your organization.

³ IDC

⁴ Forrester | Predictions 2017: Artificial Intelligence Will Drive The Insights

⁵ Harvard Business Review | The Business of Artificial Intelligence

⁶ Boston Consulting Group

The segmentation ceiling

Most marketing teams still operate using traditional segmentation models, and with good reason: segments work. “New customers” and “lapsed customers” are labels that represent big buckets of consumers with common needs.

By slicing as finely as data permits – “New customers with high disposable incomes” or “Lapsed male customers” – every marketer knows that they could, in theory, refine the message and boost engagement.

But while it has its uses, the segmentation approach is full of necessary assumptions and compromises. Together, these limitations constitute the segmentation ceiling:

- The number and type of segments are severely restricted because the data set itself is often limited, and the ability to interrogate it is constrained by human resources and the technology available.
- The human capacity to manage concurrent customer journeys is finite. The limit of most marketing teams is typically between 20 and 30 core behavioral segments (addressed through triggers and channels) and 3-5 key personas (targeted with content marketing and merchandising).
- Cohorts are fixed at the point of extraction, and have fuzzy edges. Every second between segment creation and message delivery increases inaccuracy. Based on their actions or inactions, time lapsed and other parameters, individuals that should fall out of the segment still get targeted, and those that should qualify for inclusion don't receive the message.
- The segment gets served the content they “should” want – or the closest to it, depending on creative resources available. This choice is based on anything from historical response rates in broadly similar circumstances to focus group research or pooled marketing wisdom.

The personalization challenge

Although most retailers accept the value of personalizing the digital experience, few are under any illusion about their current capabilities. Only 10 percent of retailers say they're highly effective at personalization. Starkly, consumers wouldn't even rate them that highly – only 7 percent of consumers think that brands do personalization well.⁷

But the obstacles on a journey towards a “segment of one” are significant. Those factors include budget; data (and people) in silos; and the absence of a holistic, omnichannel personalization strategy.

To take just one practical example, an average of 12 different tools are in action across the marketing spectrum. That brings challenges around licensing and support costs, functionality overlap, training overhead, disconnected data and more.

Creating a seamless or unified personalized experience across channels is hard. It needs to be more than a series of satisfactory interactions across website, email, mobile, live streams, social, or beacon-driven events.

It needs to build on the value exchange and take a customer-centric approach that anticipates and solves problems, offers more choice, reduces friction and drives interaction.

Data dilemmas

When it comes to personalization, the more that is known about each individual, the better. Pure play digital operations usually have a head start here, having built their operations around a consolidated view of their customers. Retailers with loyalty schemes are often off to a flying start too, having already found ways to capture activity across multiple channels and aggregate it.

But progress is now being made across the board and the development of a Profile Store (sometimes known as a Single Customer View or Customer Data Platform) is a work in progress for companies across all sectors. Data stores – such as that offered by Episerver Insight – offer connectors with marketing automation systems, making it easier and quicker. But above all, this is a development being driven by opportunity.

Until very recently, only enterprises with the deepest pockets had an incentive to aggregate data from multiple channels to gain a single customer view. This is because the means to segment and use this data in meaningful ways for personalization wasn't readily accessible. Artificial intelligence and machine learning have now changed everything.

Putting AI to work

AI and machine learning can help retailers make sense and make use of huge datasets. In fact machine learning requires large data sets to work. This is, after all, the era of big data.

Digital commerce is an extraordinarily good use case for machine learning with huge volumes of data to be interrogated. An application such as Episerver Insight uses selected algorithms to process and sift multiple data sources and surface patterns, clusters and trends. It can:

- Improve decision-making by understanding clusters and trends
- Reduce waste by instantly proving or disproving a hypothesis
- Influence the marketing and merchandising agenda by identifying hidden patterns and segments
- Serve up traditional persona- and behavior-based segments without labor-intensive data analysis.

Making connections

The personalization and predictive capabilities of applications such as Episerver Reach and Episerver Perform operate in a similar way, albeit using different AI methods and algorithms. The same maxim applies: more data means better decision making.

As well as profile information, AI-powered personalization can take into account previous and real-time behavior, contextual or third-party data, and the decisions made previously by every other consumer in that same scenario. The algorithms themselves are continually updated to ensure that changing purchasing or browsing patterns are taken into account, making predictions even more accurate. And above all that is a layer of manual control that is crucial to merchandisers and marketers, allowing trading agreements to be respected, or product lines to be given additional weighting in line with marketing plans.

The result? Each consumer's real-time experience is tailored using the full breadth of assets available. Any prior notion of what the consumer "should" want are replaced by an increasingly accurate prediction of what they are "most likely to want".

While the tools and applications to personalize in this way are available today, it's still early days and the opportunities to build brand loyalty through personalization and raise the barriers for competitors that follow are still plentiful. Only the most forward-thinking companies could even be said to be at "the end of the beginning" in terms of personalization - just nine percent of marketers use real-time behavior to personalize, and only 15 percent personalize beyond simple segments and clusters.⁸

But it's worth noting that to seize the opportunity is to push on an open door: 59 percent of consumers want a personalized experience online, while 43 percent are open to this when shopping in store.⁹

⁸ Episerver Reimagining Commerce Report

⁹ Episerver Reimagining Commerce Report

More data means better AI

Data is frequently described as the fuel for AI. Such is the complexity of the digital landscape that ecommerce can offer up an extraordinarily rich data set, including:

- All consumer actions (millions of events taken across all channels, such as browsing history and all transactions, both on and offline)
- Explicit consumer preferences (selections such as brands, sizes, price band, or reviews and check-ins)
- Segments defined by strategic and tactical marketing KPIs (personas, loyalty schemes, Recency/Frequency/Monetary models, etc.)
- Third-party data (social, societal, climactic)
- Unique identifiers (device ID and type).

A profile store that aggregates data such as this, similar to that featured in the Episerver Digital Experience Cloud, doesn't generally include personally identifiable information (PII). Instead the link with individuals is made via an ID as a first step towards satisfying data protection requirements.

The main uses of AI

Among marketers who have implemented website personalization in any form, the primary uses are on category and product pages, geo-targeting, transactional personalization and the use of demographics such as age, date of birth and gender. However, only a minority have implemented personalization using predictive analytics, though a majority intend to do so.¹⁰

In the email channel – where marketers have long sought to use demographic and basic profile attributes to drive relevance – real-time personalization is still an aspiration for many: 77 percent of marketers believe real-time personalization is vital, yet 60 percent struggle to achieve it.¹¹

AI on its own isn't a personalization strategy, it's an enabling technology. The ways in which it can be applied – not only to the customer experience but to data discovery, inventory management and more – are astonishing. It is powerful enough to warrant a rethink of the way in which companies choose to engage their customers because giving each customer what he or she wants has become measurably easier. But AI also makes it possible to answer previous imponderables such as discovering factors that are throttling sales – is it visibility? Inspiration? Information? What else might customers want?

Some uses of AI add brand new capabilities, such as Natural Language Processing (NLP); others bring hyper-relevance to existing customer interactions such as content and product recommendations. But while AI has the capability to revolutionize the how of digital commerce and marketing, the why remains fundamentally unchanged. Developing an AI-infused personalization roadmap requires marketers and merchandisers to stay focused on the fundamentals of building Customer Lifetime Value (CLV) and consider: how can AI help us to address our biggest opportunities and pain points?

Viewed by function, it becomes easier to map the overlap between what AI does best, an organization's touchpoints and the relative ease of implementation. In the pursuit of a better customer experience and higher revenue, Below are some main uses of AI.

1. Recommendations

Recommendations are perhaps the best-known use of AI personalization. Drawing on huge data sets with real-time updates, AI can autonomously surface product and content at an individual level where once rules and best guesses were the only tool available.

The risk is that opaque AI decisioning and inflexible algorithms add complexity, but very little clarity about what is working (and why).

A new generation of machine learning-led recommendations such as Episerver Perform (for products) and Episerver Advance (for content) gives customers and merchandisers the ability to integrate and configure recommendations at strategic points throughout the purchase funnel, with objectives and results tailored to behavior and merchandising strategies. Algorithms do the "heavy lifting" – analyzing all the data available to make real-time predictions about an individual user that are translated into product or content suggestions. But marketers remain in control, able to set brand parameters and draw insights from the changes in customer behavior.

¹⁰ Econsultancy: Conversion Rate Optimization Report 2016

¹¹ Adobe: Real Time Marketing Insights Study

2. Segmentation

AI offers the tantalizing possibility of reducing the segment size to one. But AI technology also provides marketers and merchandisers with exciting ways to visualize almost unimaginable volumes of data and segment this at intermediate stages. Episerver Insight, for example, delivers the ability to “play with the data” in a way that could never be achieved before. By knowing who your visitors are, you can see journeys that take in multiple touchpoints in different channels, and then divide these visitors into dynamic, filtered segments ready for assisted personalization. Viewing customers in this way reveals unseen patterns and correlations in the data, delivers useful narrow segments, and deliver insights that inform, shape or even define marketing campaigns.

3. Landing pages

Adding personalization to campaign landing pages provides a further layer of relevance – a boost to conversion when leads are arriving from multiple sources. Tailoring the order of products on auto-generated landing pages to match a user’s predicted behavior – a capability of Episerver Personalized Find – improves the likelihood of engaging organic visitors.

4. Search

On-site search is fertile ground for AI’s capabilities. Each search provides expressed intent (even if this isn’t always easy to interpret) alongside context and behavior. When all available site content is indexed, and faceted search is offered to users (search filters that are optionally applied), Episerver clients find that abandoned searches drop and conversions increase. AI can also assist with the initial categorization of content, too, while machine learning improves the predictive accuracy with every search performed.

5. Propensity modeling

Predictive AI can help identify which messages will most likely hit home with any given individual, or which individuals are close to making a purchase. An application like Episerver Insight has the potential to help those in digital commerce evaluate and reshape their existing acquisition, engagement and retention strategies. Predictive AI can be used at almost any stage of the digital experience, and is particularly suited to email and other forms of omnichannel orchestration. Predictive AI can also help to assist with inventory management and forecasting.

Operate at scale in new areas

Natural Language Processing

This is one of the most visible customer-facing example of AI. Users of Alexa, Google Voice, Cortana and friends are already familiar with NLP's capabilities; voice recognition in customer contact centers or customer service chatbots are other prevalent uses. But behind the scenes NLP can also power sentiment analysis to improve customer service, comment moderation and Social CRM (prioritizing responses to customers and prospects according to their expressed moods or needs).

Pattern recognition

In an era that places a high value on visual media, the ability to automatically recognize patterns wherever they occur is an area of intense interest. A "pattern" may be a product, setting, color, person or other attribute, and finding these images on social media is a task highly suited to a machine learning algorithm. Episerver UGC, for example, enables marketers to aggregate, curate and show user generated content on site.

It's worth noting that many implementations of AI in customer-facing propositions use multiple techniques. Voice search, for example, might use NLP to interpret intent, but use machine learning pattern-recognition in combination with fuzzy logic to process the request and deliver a context-relevant set of answers.

You'll find more information about these applications of AI personalization across the purchase funnel in the other parts of this AI guide series.

Episerver AI personalization

The scope for AI-powered personalization is truly omnichannel. Episerver can deploy this capability wherever your customers can be found: web, mobile, email, contact centers, in-store, IoT, print and social.

Episerver Perform

Episerver Perform uses AI to personalize product recommendations. It analyzes every visitor, their individual customer journeys, and actions of similar customers, then presents recommendations based on this behavioral data and merchandising strategies.

Episerver Advance

Episerver Advance uses AI to personalize content suggestions and automate cognitive metadata tagging and content sequencing. It keeps visitors engaged with relevant content based on their profile, interests and content popularity.

Episerver Personalized Find

Episerver Personalized Find uses AI to personalize product rankings in search results, based on a customer's purchase history, web browsing and email behavior.

Marketers in the age of personalization

The threats posed to jobs by the advent of AI and machine learning are foretold daily. Any job that primarily entails analysis and processing of data is at risk of being automated out of existence. AI-powered personalization seems to offer the prospect of fulfilling – at the level of the individual – the very definition of marketing: “creating, communicating, delivering...offerings that have value for customers” (American Marketing Association). Marketing and merchandising professionals could be forgiven for wondering where this development leaves them.

The answer is that AI reaffirms their place in the driver’s seat, fully in control, adding value where AI cannot. That’s not to deny the likelihood that AI will prompt a significant and undoubtedly large-scale realignment of roles and responsibilities in many organizations.

AI drastically reduces the resources required to interpret data, build and manage static segments, deploy and manage internal campaigns or devise content and product permutations.

Conversely there’s a greater role for AI-trained data scientists – whether in-house or third party – who are able to use their technical skills and curiosity to push the boundaries of what AI can do.

Taking a broader view, successful marketing is heavily dependent on context. Applied AI is, by definition, less successful at analyzing context. Empathy, creativity and even broader problem-solving skills are missing. The capacity to synthesize business goals, devise strategies, select KPIs and orchestrate tactical marketing efforts: this is all the domain of humans.

Ultimately, the algorithms at the heart of AI-led personalization are computer programs, written by humans. Determining the right algorithms to use, the desired output, and determining their role in the purchase process is a job that only a marketer or merchandiser can do. In the next section, we look at how digital commerce companies in particular can benefit from AI.

Relevant experiences that lead to big results

When you combine the expertise of marketers with the algorithms of AI, however, you can present relevant, engaging experiences at a level that was never before possible. Content and campaigns can now be personalized at the individual level. This is important because engagement and conversions are increasingly linked to the quality of your digital experiences.

For commerce companies, great experiences are often what sets them apart from competitors. With AI you can present intelligent campaigns and individualized content that lead to big results. In the next section, we look at how digital commerce companies can use AI to personalize large inventories and content marketing.

AI in digital commerce

Personalizing large inventories

Companies with a large and growing inventory are particularly well-suited to AI-powered marketing. Near-endless product permutations are possible, far beyond the capabilities of any team. Whereas merchandisers might previously have matched categories against audiences, for example, a machine learning algorithm will match at the most granular level available: individual against product, informed by every data point held. With the right technology, ingesting new SKUs is immediate, with machine learning driving revenue from day one.

But Average Order Value and other financial metrics aren't the only KPIs that matter. Marketers and merchandisers bring the insight and knowledge to tailor the presentation of these algorithmically-driven product selections so that other objectives can be met, for example:

- The need to respect commercial agreements around product presentation (don't show product X against product Y),
- The desire to pursue long-term brand equity at the expense of short-term revenue (don't surface final reductions at the same time as the debut of a new collection).

This is achieved through rule engines, weighting and scoring, and prioritization of campaigns themselves – all of which can be manually configured by those who know their customers, suppliers and market.

AI-led content marketing

The critical role of content marketing throughout the digital experience can be greatly enhanced with AI-led personalization, addressing questions such as:

- Should this user be presented with a brand video or other rich content to drive conversion?
- Will an article on accessories in this user's email reduce the prospect of an abandoned basket?
- Do people who search for this particular term want product specs or user generated content?

Content creation is demanding and resource-intensive. Project collaboration and workflow tools can lighten the load. The Episerver platform goes one step further by embedding these tools into the CMS itself, reducing the workload still further.

But quality still trumps quantity. Time taken previously to content tag and match is now best used to identify high priority customer journeys and corresponding user segments that stand to gain the most from content – a task made easier through machine learning-led analysis – and create the highest quality content that time and resource affords.

Episerver's T3 personalization

Episerver's solutions for personalization include an ensemble of machine learning methods. Our solutions are called T3 because they use third-generation AI approaches, unlike so many early technologies.

There's no one-size-fits-all AI solution for personalization. Across the Episerver platform, we select the best techniques and strategies based on the needs of our customers, performance and other technical considerations.

Our machine learning methods include NLP, bayesian, logistic regression, random forest, decision tree, association rule mining, collaborative and content-based filtering. We're also exploring the potential of convolutional neural networks for developing visually-aware personalization models. These models could predict a user's visual preference patterns for product images and content.

Artificial intelligence unpacked

Artificial intelligence (AI): the recreation of “intelligence” in machines. General AI uses non-human means to solve any problem and has not yet been achieved. Applied or narrow AI is task-specific, is developing rapidly and already surrounds us in more games, voice recognition, fraud detection, autonomous vehicles, recommendations and much more.

Machine learning: the most promising subfield of AI, in which computers are given the data and “teach themselves”. Different learning models are used, depending on whether the desired outcomes are known [supervised], unknown [unsupervised], to be transferred, or where rewards are to be maximized [reinforcement].

Algorithm: the rules followed by a computer to solve a problem. An algorithm may be optimized based on outcomes, and most tasks entail dozens or even hundreds of algorithms.

Neural networks: a computer system that mimics a biological neural network in the way that it learns to recognize patterns, process language, make predictions and more. A layered neural network exhibits deep learning.

Natural Language Processing (NLP): understanding the written or spoken word – processing familiar to any user of a virtual assistant.

About Episerver

Episerver empowers digital leaders to easily create engaging experiences for customers – with measurable business results. The Episerver Digital Experience Cloud™ unifies digital content, commerce and marketing in one platform, including omnichannel solutions for intelligent personalization and campaigns. Founded in 1994, Episerver has offices in the US, UK, Sweden, Australia, Germany, Denmark, Finland, Norway, Poland, the Netherlands, Spain, South Africa, Singapore, Vietnam and the UAE.

Episerver Personalization is a suite of personalization solutions powered by artificial intelligence. The solutions analyze visitor and customer data to present individualized product selections, content and search results in any channel, including email recommendations triggered by real-time behavior. Easily create relevant experiences that increase engagement, conversions and sales.

For more information, [visit episerver.com](https://www.episerver.com).

