

AO.com Delivers a Hyper-Personalized Retail Experience for Its Customers with Confluent



Headquarters
United Kingdom

Industry
Tech

Challenge
Maximize customer satisfaction and revenue growth by creating a hyper-personalized online retail experience, turning each customer visit into a one-on-one marketing opportunity.

Solution
Use Confluent to combine historical customer data with real-time digital signals from customers, generating hyper-personalized content – for example, targeted special offers – which is inserted in real time back into the customer’s session.

Confluent Features Used: Schema Registry, KSQL, Lambda Connector

Results

- Real-time hyper-personalization of the customer experience
- Increased customer conversions
- Accelerated innovation
- Confluent Cloud frees up developers’ time

AO.com is one of the UK’s largest online electrical retailers serving more than six million customers across the UK and Germany. In addition to its core retail operations, the company also has several other lines of business, including mobile, financial services, recycling, and multimedia.

AO.com differentiates itself by striving to have the happiest customers – a key founding principle and a major factor in its success. This mission led to the creation of AO.com’s Single Customer View (SCV) team in 2017, evolving into the Customer Personalisation team in 2019. The team’s goal is to take the company’s customer engagements to the next level by delivering a unified, hyper-personalized experience based on a deep understanding of each individual customer.

The team quickly realized that just relying on historical customer data wasn’t enough. Instead, it needed to treat each customer visit as a unique moment, combining real-time digital signals with historical information to give each customer what they want, when they want it. And, each AO.com line of business had unique data needs for creating a single customer view, so the team needed a flexible, extensible architecture rather than a one-size-fits-all solution.

The team decided to adopt an event streaming approach and selected Apache Kafka® and Confluent Platform to realize its vision. Jon Vines, Software Development Team Lead at AO.com, says, “With Confluent powering our Kafka deployment, we can liberate data from our heritage systems and combine it with real-time signals from our customers to deliver a hyper-personalized experience. For example, if our clickstream data shows a customer lingering over a product they looked at in the past, we can push a voucher to them in real time to create more compelling propositions for customers. You just can’t do that with a data lake and batch processing.”

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Schema Registry and KSQL were two of the big reasons why AO.com selected Confluent. As the company learns more about the signals that its customers send, Schema Registry provides an evolvable data model that allows AO.com to add new types of data, while KSQL allows them to easily transform the data and make it available for new event streaming applications. The extensive catalog of prebuilt connectors is another reason, because it makes it easy to integrate Kafka into the company’s overall architecture.

While AO.com started out with a self-managed environment based on Confluent Platform, the company recently moved to Confluent Cloud, a fully managed cloud service, that is consistent with AO.com’s focus on innovation. By letting Confluent manage its event streaming infrastructure, AO.com has removed an operational burden, freeing up its developers to focus on building new applications. It also allows AO.com to leverage Confluent’s Kafka expertise and to get seamless upgrades, giving it easy access to the latest features.

Vines sums up AO.com’s hyper-personalization journey, saying, “By understanding our customers’ needs – and responding to them in real time – we’re delivering on our promise of having the happiest customers. Confluent is a critical enabler for us, allowing us to treat each moment as a one-on-one marketing opportunity. And, we’ve only just started. The potential is almost limitless as we continue to learn and innovate.”

Business Results

- **Real-time hyper-personalization of the customer experience.** “Our customers are happiest when we respond instantly to their individual needs,” says Vines. “With Confluent, we can create a single view of each customer, giving them what they want right in the moment. It’s a huge differentiator for us and goes right to the heart of AO’s mission.”
- **Increased customer conversions.** “Our hyper-personalized approach is delivering measurable results,” Vines explains. “In our A/B testing, we’ve seen a significant increase in customer conversion rates. That’s proof that our decision to adopt a real-time event streaming approach was the right one. I expect even bigger benefits as

we continue to grow our capabilities."

- **Accelerated innovation.** "Confluent gives us the tools we need to drive innovation," Vines says. For example, KSQL is very important for us. It allows us to build up different views and create new stream processing applications. And with Schema Registry, we get a clean separation between producers and consumers, so we can easily add new types of data without worrying about breaking existing applications."
- **Confluent Cloud frees up developers' time.** "Before Confluent Cloud, when we had broker outages that required rebuilds," Vine remembers. "It could take up to three days of developers' time to resolve. Now, Confluent takes

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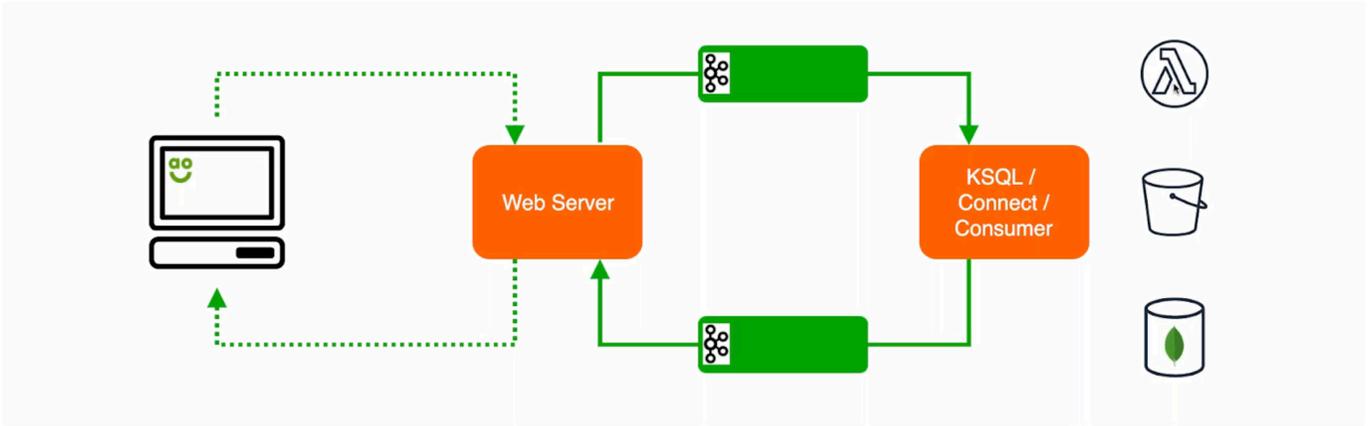
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Technical Solution

AO.com started out on its event streaming journey by extracting information from its heritage systems – for example, its order processing system – using change data capture (CDC) connectors to track updates in Microsoft SQL Server commit logs. The resulting raw event streams were handled by a homegrown Kafka cluster hosted in multiple AWS EC2 instances (since replaced by Confluent Cloud). Kafka propagated these events to a set of .NET services, which processed the data for several targeted use cases and stored the results in MongoDB.

After the success of its initial phase, AO.com decided to leverage the power of KSQL to enrich its raw event data with additional customer context, creating a second enriched event stream. Both the raw and enriched topics are sent via connectors to separate S3 buckets. The raw event bucket is used by AO.com's data scientists for research and analysis, while the enriched bucket is sent via SNS and SQS to Amazon Lambda, which applies additional business logic before propagating the results to MongoDB.

To add real-time hyper-personalization to this architecture, AO.com uses Confluent to collect clickstream events from its web server, again producing both raw and enriched topics. The enriched topic then feeds AO.com's backend Lambda/MongoDB/S3 architecture as before. In the return path, Kafka is used to stream resulting events back to the web server, injecting hyper-personalized data into the customer experience.



In the future, AO.com plans to expand its use of KSQL, creating fully fledged streaming applications instead of just enriching data. In this case, Confluent will feed AO.com’s MongoDB product store directly, rather than propagating data to Lambda. The company also plans to simplify its Lambda integration, using Confluent’s newly announced Lambda connector to directly connect to Lambda, rather than going via S3/SNS/SQS.

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