

# Amazon Personalize Enables Retailer to Build Powerful Recommendation Engine



## Executive Summary

Founded in 2003, Fifty Flowers sells primarily to DIY customers and professionals who need bulk flowers for special events and productions, including weddings, photoshoots, and more.

With the help of ClearScale, an Amazon Personalize launch partner, FiftyFlowers was able to develop a Proof of Concept for a machine learning-driven recommendation engine that enhances the online shopping experience. New and existing customers are now presented with tailored product recommendations based on numerous data points. FiftyFlowers is a wholesale flower distributor that works with a global network of partner flower farms.

“ClearScale and AWS were intricate partners to help FiftyFlowers design and implement a robust solution for our business model. I appreciated the team’s ability to quickly understand our customers, suggest innovative ideas, and help us problem solve during the beginning stages of the project.”

Liza Roeser, Founder & CEO, FiftyFlowers

## The Challenge

FiftyFlowers wanted to create a more engaging digital experience for customers that would improve both shopper satisfaction and revenue generation. The retailer knew the solution likely involved [machine learning](#) and artificial intelligence. However, the team needed help to take advantage of the technologies in a cost-efficient and effective manner.

Between hiring a data science team, acquiring robust datasets, and training models from scratch, there was so much that needed to happen before FiftyFlowers could reach its desired end state. As a result, the leadership team decided to look for a capable partner that could develop a Proof of Concept (PoC) and guide the company in the right direction. ClearScale, an [Amazon Web Services \(AWS\) Premier Consulting Partner](#) with an extensive machine learning experience, fit the bill perfectly.

## The ClearScale Solution

ClearScale determined the best path forward for FiftyFlowers involved **Amazon Personalize**, a machine learning service that enables businesses to deliver real-time personalized recommendations to users. With Amazon Personalize, developers can **build and maintain sophisticated personalization engines** with no prior machine learning experience.

Before moving forward with a full-scale implementation, FiftyFlowers wanted to see a Proof of Concept. The ClearScale created a roadmap consisting of the following components:

- Recommendation engine prototype
- Notification personalization prototype
- Search engine prototype
- Transfer learning prototype
- REST API

### Recommendation Engine Prototype

Using Amazon Personalize, the ClearScale team designed and implemented a recommendation engine prototype that presents certain goods to shoppers based on multiple factors, including purchase history, visited pages, cart additions, and time spent viewing specific items. The engine will use the available information to determine which flowers most likely fit buyer expectations and preferences.

The prototype also mitigates the machine learning “cold start problem” by using insights from existing customers to predict what new shoppers will most likely want. As a result, first-time site visitors have higher-quality shopping experiences immediately that are more likely to result in long-term relationships.

### Notification Personalization Prototype

Through the notification personalization prototype, customers receive messages and offers through SMS, email, and push notifications. Messages are personalized via Amazon Personalize to individual customers and contain flower recommendations that align with their unique preferences.

ClearScale set up Amazon Pinpoint, an AWS multi-channel engagement feature, to deliver timely outbound messages that have a low probability of landing in spam folders. The service is customer-centric, enabling FiftyFlowers to reduce churn and enhance its overall brand experience.

## **Search Engine Prototype**

ClearScale's experts also implemented Amazon Elasticsearch Service, a fully managed, scalable tool for monitoring applications and deploying intraweb search experiences.

The search engine prototype can re-rank results within a session with help of Amazon Personalize, always presenting customers with high-quality feeds. Due to the simplicity of Amazon Elasticsearch Service, FiftyFlowers' in-house team can easily fine-tune the search engine's functionality.

## **Transfer Learning Prototype**

ClearScale built a transfer learning prototype that ingests real-time data through Amazon Simple Queue Service and continually retrains the underlying machine learning program. Initially, the team planned to use the Beacon platform but decided to go with a more scalable, reliable, and serverless solution involving an SQS connection and JavaScript UI.

The prototype also uses AWS Glue, a fully managed ETL service that fetches database updates and places them in Amazon Personalize storage for retraining purposes. The transfer learning tool operates in batches, enabling FiftyFlowers to ingest data at scale simply and cost-effectively.

## **REST API**

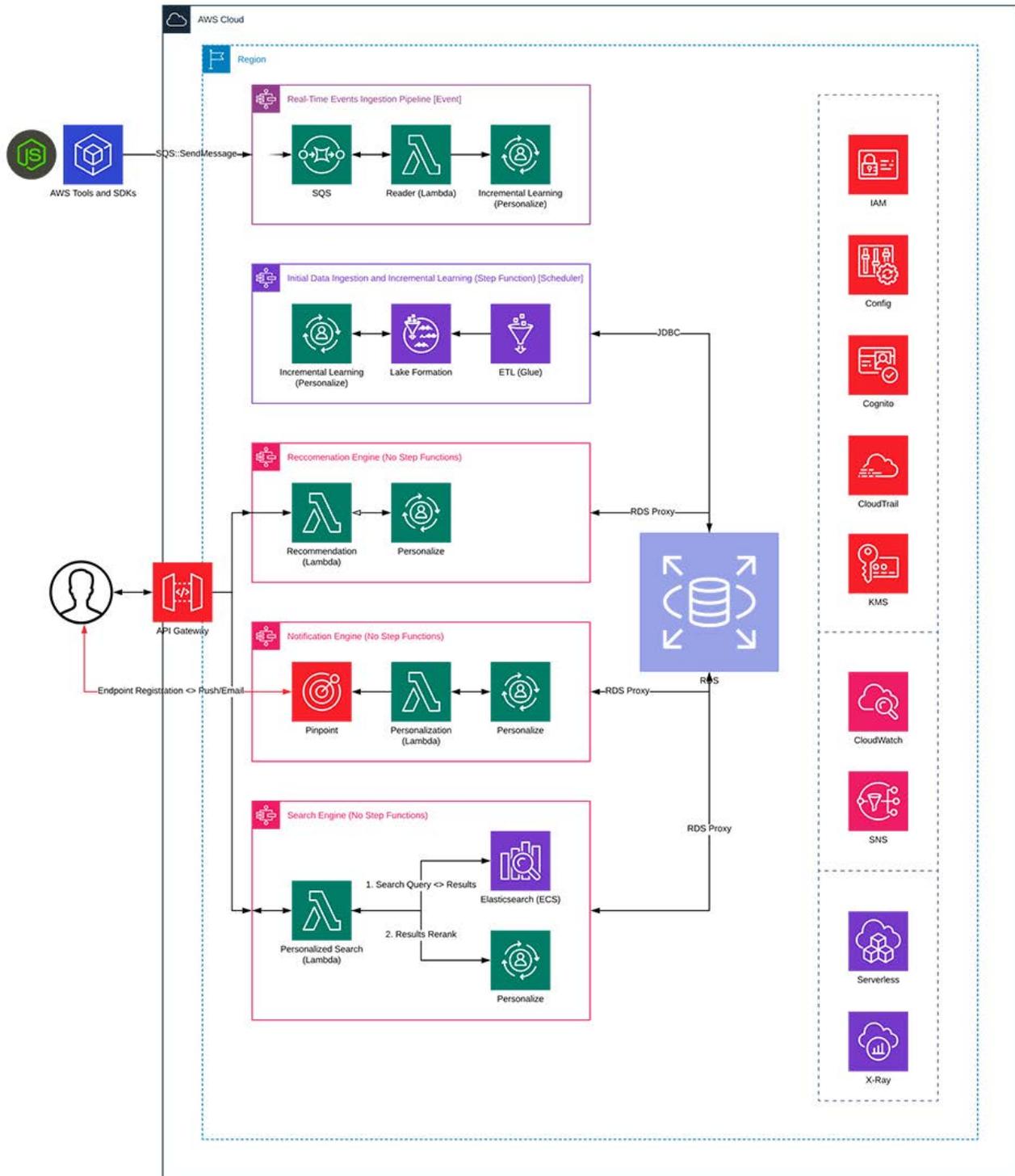
Finally, ClearScale built a serverless and decoupled REST API to enable the prototypes above. The team implemented the REST API alongside robust AWS services, including Amazon API Gateway, AWS Step Functions, and AWS Lambda, which is considered best practice.

## **Infrastructure as Code Approach**

ClearScale recognized that it would be essential to produce a prototype environment that was readily producible. As a result, the team decided to use an Infrastructure as Code (IaC) process for the FiftyFlowers project.

Additionally, ClearScale recommended FiftyFlowers go serverless to help simplify and differentiate responsibilities between the systems and development teams. The serverless framework ClearScale put in place enables developers to orchestrate and provision their entire infrastructure without waiting for the systems team.

# Architecture Diagram



## The Benefits

By partnering with ClearScale and AWS, FiftyFlowers was able to create a convincing recommendation engine Proof of Concept to enhance the end-user experience for its floral customers. The company will be able to deliver product recommendations that align with shopper preferences, thus creating more compelling buying opportunities and increased revenue potential.

The new recommendation engine is fully automated and managed by AWS. FiftyFlowers [does not have to maintain an in-house data science team](#) to take advantage of two decades of Amazon intelligence, which is the most comprehensive retail dataset in the world.

The FiftyFlowers team can customize how often the database ingests new information, and flex with changes in demand, especially given how much seasonality impacts the business model. The solution incorporates analytical insights in real-time, including global retail trend data gathered by Amazon, to boost prediction accuracy.

By relying on AWS, the company has offloaded much of its administrative burden and created additional capacity for in-house developers. Not only is FiftyFlowers' new solution effective, but it is also simple to manage.

The engine also manages multiple customer engagement channels on its own and can send personalized notifications across various mediums. Additionally, it can re-rank search engine results to reflect the latest information available.

One of the most significant advantages of FiftyFlower's new personalization engine is that it also works for new site visitors. Compared to other machine learning solutions, FiftyFlowers can use the behaviors of past customers to make accurate predictions about new shoppers.

Finally, FiftyFlowers' personalization engine is entirely serverless, which means the company can quickly scale with demand and only has to pay for the resources it uses. The retailer's IT cost structure, and ongoing expenses, are much lower than they would be otherwise. Should the application fail for any reason, FiftyFlowers can also redeploy the architecture thanks to ClearScale's IaC approach.

Moving forward, FiftyFlowers is well-positioned to build stronger relationships with customers and create new buying opportunities that ultimately increase bottom-line profitability. The company also has an expert partner in ClearScale that can help the retailer continue to take advantage of AWS features to outpace the competition in the floral distribution world.