Scaling Klaviyo Engineering in 2018

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2018 was a record setting year for Klaviyo and also a year of intense growth for Klaviyo engineering as we scaled our product and our teams to new heights. On the product side, we were excited to increase our pace of shipping compelling new features and innovations. These include everything from launching brand new offerings such as our form builder, a best in class way to easily embed personalizable forms on customersâ€™ sites, to innovative enhancements such as supporting geolocation as a first-class citizen within our offerings. Additionally, we released powerful overhauls of key features including an elegant and powerful visual interface for our flow builder enabling marketers to tap into their data flows and manage sophisticated branching logic as well as customizable analytics dashboards to enable customers to drill into all aspects of their business.

Nearly 100% Growth

Klaviyo nearly doubled in employees and revenue in 2018 and we passed the mark of having 10,000 paying customers and continued our remarkable ability to remain profitable even as we grow tremendously fast. The engineering team itself grew as we hired 9 engineers and scaled our engineering organization from 4 to 9 different team pods. Our data science team went from an idea to a dedicated and innovative cross-functional team working in all aspects of the product and releasing innovative new features such as customer lifetime value calculation while actively sharing their research findings as well. We scaled our engineering processes by rolling out cross-team standup meetings and implementing an RFC process where engineers collaborate on the technical approach across stakeholder teams before writing any code. We also began sharing regularly what weâ€™ve built at science fairs for the entire company to learn.
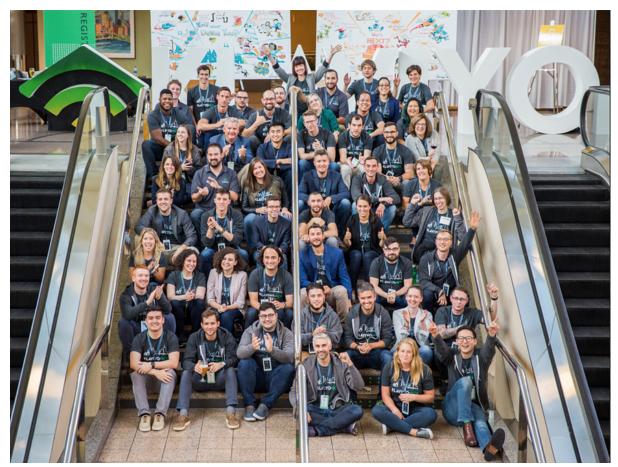
Science Fair deep dive on analytics optimizations

6 engineering promotions

A cornerstone of our company is our bi-annual review cycles. We believe in regular and steady feedback and we were excited to promote 7 engineers to be senior engineers in 2018. Additionally, we hired 3 engineering directors to lead our pods in 2018 â€" each director with their own specialty and focus. We believe in developing our talent as well as supporting the community, so 2018 saw us begin to both host the Django Boston Meetup plus share our experiences in scaling Django. We sent developers to conferences such as PyCon, ReactConf, ReactRally, QCon NYC, Distributed Data Summit (Cassandra conference) and DevOpsDays Boston. We also sponsored DevOpsDays and were very fortunate to have Klaviyos both speak at and co-organize the conference.

Face to face conversations with 54 customers

One of the highlights of the year for the entire company was our first-ever customer conference. Most companies tend to restrict which employees get to interact with customers at events such as this to those in sales and marketing. However, Klaviyo does things a little differently as we believe in personal connections. Thus, we had the entire company participate in the event and during a keynote directly encouraged customers to come to â€œMeet the Eng/Product Teamsâ€� where we met 54 customers and got their direct feedback on the product. Additionally, we had 9 product managers, designers and engineers create and deliver sessions to educate Klaviyo users on our product and best practices.

Team photo after Klaviyo:BOS 2018

1+ billion events per day

The biggest time of the year for us and our customers is the holiday season Black Friday was a [terrific event](#) for all involved. We ingested and processed in real-time over a billion events per day and sent a billion emails over the course of Cyber Weekend (Friday through Monday). We shattered operational records left and right and at one point were doing over 1 million requests per second to our Cassandra cluster keeping over a trillion metrics updated in real-time. Our workloads just keep growing year over year and we continue to be laser-focused on reliability. With that in mind ahead of the holiday season we revamped our load testing frameworks allowing us to run production-scale tests quickly to performance test key areas of the platform.

On the technology choice side Klaviyo is dominantly a Python shop although we have historically used the best tool for the job with a smattering of services written in languages ranging from NodeJS or C. 2018 saw the first substantial investment in other languages as we rearchitected elements of our analytics pipeline using Java and Apache Flink to great success. We recently blogged about how our new [â€œAbacusâ€� system](#) helps us aggregate billions of events daily using stream processing leveraging Flink and Kafka to give us valuable control over each phase of the analytics pipeline.

100% of platform servers in VPC â€" down with ClassicLink

As weâ€™ve grown both our systems and our engineering teams weâ€™ve had to continue to evolve our architecture. 2018 saw us move our core workloads entirely into VPC, Amazonâ€™s modern networking stack â€" no small feat for an organization that runs thousands of EC2 boxes and that started before VPC was the default on AWS. We also formally embarked on a path to rolling out a service-oriented architecture by launching our first microservices on top of Kubernetes. This is a strategic project for us as we begin to break pieces of our monolithic but

sophisticated Django application into smaller units and scale how our teams interface with each other and the outside world.

We modernized our frontend architecture by creating both the Klaviyo Component Library as well as something we call Fender, our frontend repository for Javascript. Weâ€™ll be continuing that effort this year as we roll out a consistent design system across the app. Additionally, we refactored major subsystems such as segmentation demonstrating that dramatically improving code quality also allows us to achieve developer productivity benefits to enable us to more quickly release new features and dramatically improve performance (such as a 27x speedup for segmentation!) for our customers.

120 Klaviyos flown to a Patriots game in Miami

In true Klaviyo fashion, we ended the year with several celebratory events including flying the entire company on a private jet to Miami to watch the Patriots play (read about it on Patriots.com!), and celebrating the year with our coworkers and loved ones enjoying the view from the top of the Prudential building in Boston.

Weâ€™re now excited to have a tremendous 2019 as we continue to grow our team by both hiring on all fronts as well as enabling a culture of learning and advancement, and ultimately creating technology that matters here in the heart of Boston.

Renting a private jet to go watch the Patriots for the 2nd year in a row