AKF Partners Case Study

Engagement Type: Long Term Interim CTO Role
Industry: **Online Marketing Analytics**

Introduction

In 2012, AKF first engaged with a Manhattan-based startup that provides a subscription-based service for marketing analytics. The initial engagement was through a technical due diligence on behalf of an investor. Several short and long term engagements followed, during which AKF helped reshape the company's architecture, organization, and process. In 2016, the startup was acquired for $250M, in part, because of its proven ability to grow and scale.

In the fall of 2012, Hurricane Sandy hit New York City causing significant infrastructure damage to the city. At that time, this startup had its office in Lower Manhattan with its production datacenter in Philadelphia. While the datacenter survived the storm with no disruption, critical infrastructure that was served from the NYC office (including backoffice, phone, email, and some production services) was badly disrupted. The hurricane exposed significant need for a disaster recovery plan as well as changes in architecture.

Challenges

During AKF's diligence, we identified problems including:

Technology & Architecture
- Multiple single instances and single points of failure (SPOFs)
- Product hosted in 1 datacenter only
- Monolithic database
- Heavy use of logic in database (stored procedures)
- Poor data management – multiple ways to update same element with no archiving or purging strategy

Organization:
- Although small in size, teams operated in silos with poor communication
- Traditional "IT" skillsets, not modern infrastructure service providers
- Head of IT, no true CTO or similar role

Process:
- Although considering Agile, no well-defined PDLC
- Lacked operational processes: Incident/Problem Management, Post Mortems

- No process for paying down Technical Debt
- Lacked any process for selecting and managing vendors, especially budget oversight

Early Engagements

Over the course of 2013 to early 2015, AKF was reengaged by the company directly to help work through strategies and solutions to these issues. During these engagements AKF was onsite for a few days at a time, and we held an on-going advisory role. Over the course of these two years, together we implemented changes on multiple fronts.

A major first step was to resolve their DR challenges. By early 2013 the company had already embarked on a plan to move their production datacenters out of Philadelphia (Level 3) and into Telx facilities in Chicago and New York. Initially AKF challenged the location and recommended moving some services into the public cloud (starting with development environments), but we did agree that the moves in the interim would improve their situation. The office was also going to move from Lower Manhattan to Time Square, and we could use that opportunity to move more services critical to the product out of the office and into a datacenter. Although the new datacenters would operate in an Active/Standby design, they would remove some SPOFs in the architecture. However, the cost of operating 2 datacenters (one a standby site only) was unnecessarily high.

Another progressive step architecturally was to start to pull logic from the database and begin implementing microservices. The company began developing new services following the CQRS (Command Query Response Segregation) pattern, which allows applications to interface different databases for reads and writes, setting a foundation for improving performance on the overly taxed database.

Organizationally, by mid 2013 the teams were beginning to fully embrace an Agile PDLC. By late 2013 we also implemented a Product Council, composed of product and business leaders which was chartered with setting strategic product direction and fielding changes from the roadmap. From 2013-2014, although they made strides, they still suffered from frequent changes to the product roadmap and an IT team that lacked skills in DevOps, deployment, and operations.

Long Term Engagement

By March 2015, although the company had made progressive steps, there was still a lot of work to do. They decided to bring on AKF to serve as interim CTO.

When AKF first came onsite full time, product availability from a customer perspective was low. Although the team was not calculating & tracking availability, there were several product outages in the first few months of 2015 (including a 6+ hour downtime two days before we arrived). Most of the outages could be traced back to their monolithic SQL Server DB and the team's lack of ability to monitor and recover the DB during an outage. We engaged 3rd party expertise to provide support of the DB environment. We implemented several of their recommended configuration changes and deprecated many stored procedures that were no longer needed.

We also conducted a deep analysis of their overall datacenter configuration. Costs were really high given the size of the company and product being supported. There was a lot of wasted storage and compute which added to the infrastructure cost – they had so many VMs running duplicate copies of code that no one had a complete picture of what was where (adding to confusion during any outage and failover). There was no archiving strategy and they were keeping copies of backups indefinitely. We quickly realized that we could cut down on costs significantly by eliminating this excessive, unused redundancy and by moving all of their product services into the public cloud. Architecturally, the team had implemented enough changes to operate relatively efficiently, in multiple zones, and began taking some immediate advantages of the public cloud's elastic nature for scaling services up and down. Because the product was based primarily on a Microsoft stack, it made sense to transition to the Azure platform. Over the next several months, we planned a migration that would begin in August and finishing in early September.

We reorganized the product, engineering, and IT teams into two agile teams. Each team was composed of a product leader, engineers, testers, and a new DevOps role, which would allow each of them to manage their services end to end, from product concept to delivery to support. IT for back office systems and office support would be moved to a separate group. The teams each moved to a two-week sprint cadence, with the intent of shipping completed product components as a release at the end of each sprint.

The development team had begun moving toward a service-oriented architecture, and all new services were built using this approach. However, refactoring required legacy functionality to an SOA framework was not moving forward. In addition to splitting the teams for increased efficiency and ownership, we developed a roadmap to migrate the entire architecture to a fault-isolated SOA and got buy-in from executive leadership to allocate a certain percentage of each sprint (20%) to servicing technical debt (mostly in the form of migration).

Results

The primary project – migrating the product to Azure and shutting down the Telx datacenters, was executed on time and with great precision. The actual migration occurred over a three-week period, where applications and services slowly started taking traffic, culminating in an eight-hour database cutover executed in late August 2015. The migration went without a hitch. We set a deadline to shut down the datacenters by the end of September and hit the deadline. Remaining services not supporting the product were moved to either Azure or to the new corporate office.

Highlights of the interim CTO engagement include:
- Executed a cutover to Azure in three weeks
- Shut down two datacenters in four weeks
- Lowered data center operating costs by $500k per year
- Eliminated 16 vendors and services that were superfluous or unnecessary, resulting in a reduction of $300k in annual costs
- Reorganized technology team; promoted a new VP and built two agile teams
- Hired a new DevOps engineer
- Created a budget planning and tracking template
- Consolidated monitoring platform; cleaned up current PRTG system, implemented Pager Duty for escalations

Client Testimonial

We first met AKF in 2010 when they did the tech due diligence for a private equity firm that wanted to invest in eMarketer. I was so impressed with AKF's knowledge, thoroughness, and no BS approach, that I continued to bring them back in to do annual tech reviews. In late 2014, we became convinced that it was time for a new approach to our infrastructure and software development to meet the needs of our fast-growing client base. It was also apparent that we lacked the leadership skills and experience to get the job done. AKF served as our virtual CTO for about 8 months and helped us make huge improvements in virtually every area related to IT and engineering. Just as important, they helped us identify the people on our team who could move into leadership positions. Marty, Mike and the entire AKF team were terrific. We'd never have been able to grow our user base tenfold without them.

Terry Chabrowe, CEO eMarketer

AKF Can Help

If your company suffers from similar problems of availability, scalability, slow innovation, or technology leadership, reach out to us. We've spent over a decade helping companies scale their architecture, organization, and processes to achieve successful outcomes.