

CASE STUDY: MARKETSHARE AND ARCADIA DATA

Taking a Faster Route to Detailed Big Data Insights

**MarketShare Taps a Hadoop-Native Analysis
Option to Drive Deeper Analysis and Big Data ROI**



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TABLE OF CONTENTS

AT A GLANCE 3

THE COMPANY 5

THE CHALLENGES 5

THE SOLUTION 7

THE IMPACT 9

THE TAKEAWAYS 10

THE RECOMMENDATIONS 11

ANALYST BIO 13

ABOUT CONSTELLATION RESEARCH 14



AT A GLANCE

MarketShare, a Neustar solution, helps marketers make better decisions faster and to increase sales and gain market share on a global scale. Going beyond business intelligence (BI) reporting, the company also offers decision analytics and prescriptive recommendations that help marketers optimize future spending by choosing the right content for the right audiences, markets, channels and media placements. The company has more than 100 clients, including Fortune 1000 firms such as MasterCard, Turner Broadcasting System, Intel, USAA, CarMax and Twitter.

At the center of MarketShare services are data-driven prescriptive recommendations derived from descriptive and predictive insights based on Big Data analysis.

The company delivers insights through a cloud-based application that runs on Amazon Web Services. In 2013, the company moved Big Data analysis to the Altiscale cloud-based Hadoop platform.

By mid-2014, MarketShare recognized that its data-analysis approach needed to evolve. The company wanted dynamic, rather than pre-defined, reporting capabilities. It also wanted the ability to drill down to the raw-data details on individual customer interactions. In place of the scale-constrained relational database and data-analysis tools it was using, MarketShare implemented Arcadia Data in early

MarketShare

- **Headquarters:** Los Angeles, Calif.
- **No. Employees:** 250+
- **Revenue:** \$57 million (12 months ended Sept. 2015)
- **Industry:** Marketing analytics and planning
- **Ownership:** Acquired by Neustar, Inc., Dec. 2015
- **Founded:** 2005

Business Themes



Future of Work



Digital Marketing Transformation



Data to Decisions



Technology Optimization

2015. A Hadoop-native visual analytics and BI platform, Arcadia Data enabled the company to deliver relevant data and customized reports more quickly and easily, while also better supporting client-specific querying down to the level of individual customer interactions.

Challenges

- Extracting boiled-down Big Data sets from Hadoop required a full day of MapReduce jobs and Hive querying.
- Loading data into Oracle and developing custom reports in Tableau required two additional days of labor-intensive work.
- Users lacked the ability to drill down from broad trending information to rich, behavioral detail in raw data.

Solutions

- Migrated to Arcadia Data, a visual analytics and BI platform that runs natively on Hadoop. MarketShare runs Arcadia Data as a service on its cloud-based Altiscale Hadoop instance.
- Created templated reports that can be customized by selecting parameters to generate

client-specific reports.

- MarketShare embeds client-specific reports and data access within specific tenants of its cloud-based application.

Benefits

- Labor-intensive extraction and movement of data eliminated.
- Custom reports are generated on the fly by selecting client-specific parameters available through templated reports.
- Reporting time and effort cut from two full-time-equivalents (FTE) for three days down to one FTE for half a day.
- MarketShare clients gained the ability to drill down on and apply ad-hoc analyses to detailed data in Hadoop.
- Accelerated time to market for new media insight reports.

THE COMPANY

MarketShare develops prescriptive analyses from Big Data to help marketers gauge the effectiveness of their marketing spend across Internet and mobile channels as well as conventional media, including television, radio, print, billboard and in-store campaigns. MarketShare customers rely on the firm's cloud-based reporting and predictive planning tools to set their daily, monthly, quarterly and annual budgets. With each new campaign, customers can use the latest data and fresh models to precisely reallocate planned spending on digital and conventional marketing and then adjust spending throughout the campaign lifecycle.

In December 2015, MarketShare was acquired by Neustar, Inc., a services firm that helps marketers better understand prospects and customers in order to improve conversion rates, optimize and automate media, and increase sales. By combining the two firms, Neustar says it will extend its data-driven insight to help marketers better plan, optimize and allocate their marketing budgets.

THE CHALLENGES

Data-driven insights in cost-effective marketing have been MarketShare's differentiator since its founding in 2005. But what started as a Small Data analysis challenge in the company's early days evolved into a Big Data challenge by 2012. That's when the firm shifted from analyzing gigabyte-scale data to using terabyte-scale data stored on Hadoop. The goal of using more data and a greater variety of data was to improve accuracy and to better measure digital activity across emerging mobile and social channels.

In 2012, MarketShare was running its customer-facing applications as well as back-end data processing and data modeling on Amazon Web Services cloud infrastructure. With the move to Big Data, the company switched from using MySQL to Hadoop. MarketShare's first Hadoop platform was Amazon's Elastic MapReduce (EMR) service, but in early 2014 it switched to Altiscale, a cloud-based Hadoop service that delivered better performance, reducing data-processing

times from as long as two weeks to less than 48 hours. Nonetheless, data-analysis challenges remained.

With the embrace of digital campaign information, MarketShare needed to analyze data on a whole new scale. “Instead of looking at aggregated data on a weekly basis, we decided to look at spend related to every single individual ad impression,” says Satya Ramachandran, MarketShare’s head of engineering. “That entails looking at tens of terabytes instead of hundreds of gigabytes.”

MarketShare’s starting point for Big Data analysis includes non-aggregated data drawn from customer relationship management (CRM) and enterprise resources planning (ERP) systems combined with other internal source systems and third-party macroeconomic data. In addition to looking at impressions by product, time, media channel and geography, customer-specific data attributes also come into play.

All told, MarketShare Big Data analyses start with 20 to 30 terabytes of historical data, but its initial Big Data reporting approach – exporting Hadoop data extracts to Oracle Database and creating custom reports using Tableau – posed several challenges:

“We wanted complete transparency on each customer interaction, ranging from paid, owned and earned media to CRM, Sales and Service, which allows us to better understand the customer journey leading to conversion.”

- Tanwir Danish, head of product & user experience, MarketShare

The Technologies

- Arcadia Data - Hadoop-native platform for visual analytics and BI reporting.
- MarketShare is running Arcadia Data on Altiscale, its cloud-based Hadoop service.

- **Data-analysis delays.** MarketShare used MapReduce processing and Hive queries to develop customer-specific data sets for analysis, a step that took about one day.
- **Data-export delays.** Another half a day was required to transform and load data into Oracle Database.
- **Report-development burdens.** MarketShare analysts then had to manually create one-off, customer-facing reports using Tableau. These custom reports were then embedded into MarketShare's DecisionCloud app. These steps took another day and a half, bringing total, end-to-end process time to three days.
- **Lack of detailed insight.** MarketShare's data extraction and reporting approach limited the ability to drill down from broad trending information to rich details in raw data on Hadoop. "We wanted complete transparency on each customer interaction, ranging from paid, owned and earned media to CRM, Sales and Service, which allows us to better understand the customer journey

leading to conversion," said Tanwir Danish, MarketShare's head of product and user experience (UX). "That type of reporting is very dynamic, versus the static, pre-defined reports we were using."

THE SOLUTION

MarketShare recognized the need for deeper insight and a more efficient approach to developing client-specific reports in mid-2014. It was at this point that the company discovered Arcadia Data, which appealed to MarketShare in that it's a Hadoop-native platform that provides direct access to data on Hadoop clusters. Arcadia Data also supports visualization, production and ad-hoc reporting to support fast turnaround on new types of attribution analysis reporting.

"We've been moving away from traditional technologies to ones that are much more adept at handling the volumes of data that are required to understand every customer interaction that marketers are interested in," Danish told Constellation Research.

Arcadia Data was founded in 2013, and as an early customer, MarketShare was able to have significant input into Arcadia Data's product direction. "That was a key driver of the selection," according to Danish. "We also liked the fact that it's not just visualization that Arcadia Data provides. We could also run our own visualizations on top of their reporting engine."

MarketShare implemented Arcadia Data in late 2014 and brought its Big Data visualization and reporting capabilities into production within its applications in the first quarter of 2015. The company uses Arcadia Data for direct access to Hadoop data from MarketShare DecisionCloud Apps as well as for custom-reporting, visualization and ad-hoc analysis, as detailed below:

1. **Direct access to Hadoop.** MarketShare has its own visualizations built into its DecisionCloud Apps. The use of the product starts with access to tables and views of Hadoop data directly from Arcadia Data's reporting engine.

2. **Fast, templated reporting.** MarketShare uses Arcadia Data's templated reporting capabilities, which let advanced data analysts and business users alike create reports against a range of dimensions and measures of interest. To develop client-specific reports, MarketShare simply selects the parameters of interest to that customer and the reports are generated on the fly.
3. **Rapid embedding into applications.** Arcadia Data views, custom reports and ad-hoc visualization and analysis capabilities are embedded directly within MarketShare's DecisionCloud Apps through open REST APIs.
4. **Drill-down analysis to granular detail.** MarketShare's "Progressive Disclosure" report – just one of the reports that drill down from broad trends to details in raw data – enables DecisionCloud users to drill down from marketing channels to sub-channels to tactics to campaign-level details, such as conversions by inventory provider and specific placement.

THE IMPACT

The switch to Arcadia Data enabled MarketShare to deliver fresh marketing attribution data to its customers six times faster. It also enabled the company to deliver drill-down insight into the behaviors of individual (anonymized) customers. This depth of insight is crucial for marketers seeking to optimize cross-channel audience targeting. MarketShare also applies advanced, predictive analytics to offer campaign managers and media planners recommendations on future investments that are driving improved performance.

The benefits of MarketShare's use of Arcadia Data include the following:

- **Data extraction and data movement steps eliminated:** The one-day step of creating data extracts and half-day step of transforming and exporting that data to a relational database have been eliminated.
- **Custom-reporting streamlined:** MarketShare client-services team uses

Arcadia Data's drag-and-drop Build interface to create templated reports covering the range of dimensions of data of interest to its clients. To generate client-specific reports, the team simply selects the parameters of interest to that customer and the reports are generated on the fly. Where building custom reports used to take three days (including 1.5 days for report development), MarketShare now generates custom reports within two to four hours.

"Arcadia was a better choice for us because the reporting approach scales," Danish told Constellation Research. "Now we have a configurable environment versus having an ops person creating one-off reports."

- **Depth of analysis enhanced:** The aggregated data extracts used in MarketShare's original reporting approach limited the detail available for analysis. Arcadia Data's filtering and drill-down capabilities make it possible for marketers to explore individual customer behaviors.

- **Customer experience improved:** Because it can develop new reports in as little as an hour, MarketShare has instituted iterative learning sessions through which beta clients offer rounds of feedback before new reports are put into production. “With Arcadia, we can quickly create reports and publish them to our DecisionCloud Apps for client user feedback,” said Danish.

THE TAKEAWAYS

Managing data at scale is the first challenge in Big Data, and for that, organizations have settled on Hadoop and NoSQL databases as their next-generation platforms. The next (and perhaps bigger) challenge is analyzing data at scale, and on this front organizations are employing a mix of old and new technologies. MarketShare started by boiling down Big Data sets into extracts that could be handled in a conventional reporting environment, but the approach proved both time- and labor-intensive and limiting in terms of depth of insight.

Hadoop-native tools are emerging that were designed from scratch to handle data at scale while also supporting fine-grained analysis down to the raw data. “If our clients see something of interest, they can drill down to campaign tactics-level details, including inventory providers,

“Arcadia was a better choice for us because the reporting approach scales. Now we have a configurable environment versus having an ops person creating one-off reports.”

– Tanwir Danish, head of product & user experience, MarketShare

placements, offers, creatives and target audience,” Danish said.

Lessons learned from the project include:

- **Look beyond familiar tools.** It’s tempting to “go with what you know,” but sometimes new platforms call for new tools. MarketShare discovered that force-fitting Big Data extracts into relational databases and tools designed for conventional-scale data didn’t work. A Hadoop-native platform offered a streamlined workflow and analysis of data at scale.
- **Consider people costs.** MarketShare chose a new data-access and analysis platform in part because it eliminated database administration and manual report-development requirements. With direct access to Hadoop and a templated approach, report-development time dropped from two full-time-equivalents (FTE) for three days down to one FTE for half a day.
- **Respect the value of the data.** Big-picture trend analysis is fine, but for marketers and

professionals in most industries, the most valuable insights lie in the detailed raw data. Whether it’s personalizing marketing offers or medical treatments, optimizing factories or equipment maintenance, or spotting fraud and risk, it’s vital to see the details as well as the big picture in Big Data.

THE RECOMMENDATIONS

Plenty of companies have settled on Hadoop as their Big Data platform, but the next challenge is understanding, accessing and reporting on the data in Hadoop in an efficient and repeatable way. Hadoop-native tools are emerging that are designed to run on the same infrastructure and provide easier access to the data therein. To make the most of a Hadoop data lake/hub, Constellation Research recommends that you consider emerging Hadoop-native options in the following categories:

1. **Data discovery and governance.** Discovery starts with inspecting and cataloging the data within Hadoop and understanding the lineage and sensitivity-specific data

sets. Here's where vendors including Alation, Waterline Data and Zaloni are supplementing the capabilities of open source cataloging, lineage and governance components within the Hadoop ecosystem. MarketShare is using Alation in this role.

2. Self-service data preparation. Once you spot the data within Hadoop, it often needs to be cleaned and transformed in order to be more useful for analysis. Here's where vendors including Datameer, Paxata, Trifacta and Tamr are helping companies to prepare and mashup Big Data for downstream analysis. MarketShare's prep needs are limited, so it's using Hive, MapReduce and internal tools for data prep.

3. Data access and analysis. Here's where companies have to find a way to turn data into insights that will drive better decisions. MarketShare chose Arcadia Data as its data-access, visualization and analysis platform. The company taps into Arcadia Data's reporting engine directly to power its own visualizations while also using Arcadia Data's ad-hoc and drill-down analysis capabilities.

ANALYST BIO

Doug Henschen

Vice President and Principal Analyst

Doug Henschen is VP and Principal Analyst at Constellation Research, focusing on data-driven decision making. His Data-to-Decisions research examines how organizations employ data analysis to reimagine their business models and gain a deeper understanding of their customers. Data insights also figure in tech optimization and innovation in human-to-machine and machine-to-machine business processes in manufacturing, retail and services industries.

Henschen's research acknowledges the fact that innovative applications of data analysis requires a multidisciplinary approach starting with information and orchestration technologies, continuing through business intelligence, data-visualization, and analytics, and moving into NoSQL and big-data analysis, third-party data enrichment, and decision-management technologies. Insight-driven business models and innovations are of interest to the entire C-suite.

Previously, Henschen led analytics, big data, business intelligence, optimization, and smart applications research and news coverage at InformationWeek. His experiences include leadership in analytics, business intelligence, database, data warehousing, and decision-support research and analysis for Intelligent Enterprise. Further, Henschen led business process management and enterprise content management research and analysis at Transform magazine. At DM News, he led the coverage of database marketing and digital marketing trends and news.

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