

NUCLEUS  
RESEARCH

ROI: 144%  
Payback: 2.1 Years

# VERTICA

# CRITEO

## ANALYST

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## THE BOTTOM LINE

Criteo deployed Vertica on-premises to accommodate the volume and velocity of data the company processes daily, increase revenue by reducing the time-to-market, and add advanced analytics capabilities to manage Criteo's resource management. The company experienced year-over-year revenue growth and increased productivity from faster processing and task automation with Vertica. Since deployment, the organization has seen an average revenue increase of more than 21 percent and improved IT productivity that saved the company more than \$500,000.

## THE COMPANY

Criteo is an advertising platform for the Open Internet, with an ecosystem favoring neutrality, transparency, and inclusiveness. Criteo works with Internet retailers and delivers personalized online display banners to consumers who visited the advertiser's website but did not make a purchase. The company was founded as a start-up in 2005 in Paris, France, and currently operates in a total of 30 markets around the globe.

The Criteo team of 2,800 members across all the offices partner with customers and publishers to deliver effective advertising across all channels, and at all stages of the purchase funnel. Criteo gives marketers, e-merchants, and brands the solutions to convert as well as stay in contact and multiply touchpoints with consumers that have demonstrated an interest in their product. Criteo works with Internet retailers and delivers personalized online display banners to consumers who visited the advertiser's website, but did not make a purchase. To do this, Criteo applies advanced machine learning (ML) and Artificial Intelligence (AI) to data sets and creates a unique shopper graph. Criteo offers a technological alternative for retailers and brands who want to keep control over their data in an open environment.

**Cost : Benefit  
Ratio**

**1 : 2.4**

## THE CHALLENGE

Criteo is positioned for delivering real-time retargeting insights with sophisticated IT support, infrastructure, and in-house data scientists. Hadoop scaled well in storing the massive amounts of data Criteo needs to run its business (currently over 100PBs) but was incapable of providing speed-of-thought response times for advanced analytic queries. Criteo uses massive parallel processing (MPP), which is the coordinated execution of a program by multiple processors that work on specific parts of the program, to improve the speed and performance of high-volume data processing.

The company looked at SAP HANA, Dell EMC, Greenplum, MS PDW and Amazon Redshift but chose Vertica because it could not only process multiple jobs concurrently in real time, but was better aligned with Criteo's needs, and could integrate with the Hadoop framework. Additionally, Criteo found that Vertica delivered complex structured query language (SQL) analytics without additional software, enabling Criteo to optimize its display banners across desktop, mobile, and applications.

## THE STRATEGY

Criteo began the implementation of Vertica in June 2013 and was fully operational in December of that year. Vertica was installed on the Criteo servers and senior staff described the deployment as a stress-free process that received strong support from Vertica engineers. Criteo spent two weeks conducting local testing to assess performance. Training time on the solution is included in staff orientation, and the learning curve is described as minimal to reach proficiency.

## TYPES OF BENEFITS



## KEY BENEFIT AREAS

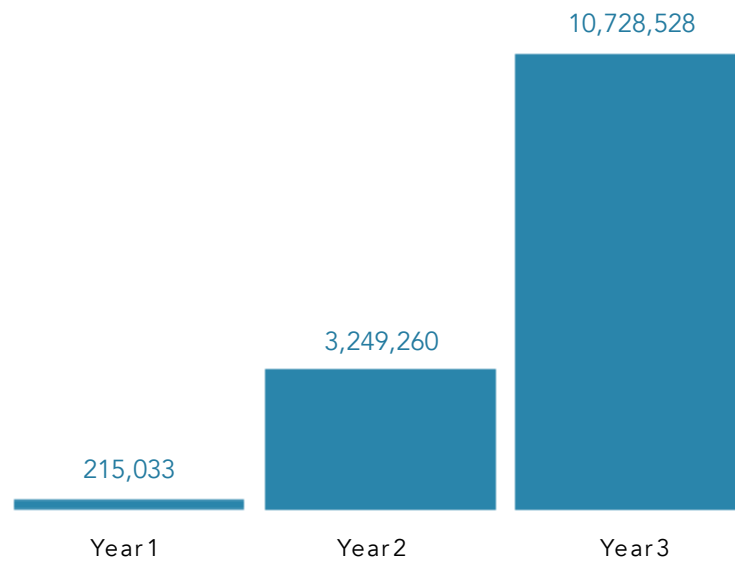
Key benefit areas seen as a result of the Vertica deployment include increased revenues, faster processing speed, scalability to meet growth, improved IT and management productivity, and increased insights from analytics.

- Increased revenues. Criteo has experienced double-digit growth in both clients and revenues since the Vertica deployment. Vertica's ability to manage massive datasets has enabled Criteo to support the additional business. Since the implementation of Vertica, Criteo has achieved an average annual revenue increase of 21 percent.
- Scalability. Vertica has accommodated the company's growth and increased volume of data without additional software costs. Additional server expenses are considered to be the cost of doing business in a growth environment, but no additional software costs were incurred.
- Improved productivity. The production database team that previously supported the processing and analytics has been able to refocus 50 percent of its time to other revenue-producing areas in IT. The in-house Vertica manager has also reduced the time he spends supporting the process by 50 percent.
- Creation of Center of Excellence (CoE). With Vertica, Criteo built a CoE model with a designated senior staff member to lead a centralized team that manages analytics initiatives and is the resource for best practices. This model has enabled Criteo to realize greater visibility into its internal workflows, inform staff, and assure alignment with its business goals and objectives.

## KEY COST AREAS

The most significant cost areas of the Criteo deployment of Vertica are license and maintenance fees. Other cost areas over the three years included the price of additional servers and configuration expenses. The Criteo business model is based on an extensive in-house software database infrastructure and sophisticated IT depth and expertise. As a result of its unique model, personnel time for the deployment was minimal, and new hires are trained on Vertica as part of their orientation.

## CUMULATIVE NET BENEFIT



## LESSONS LEARNED

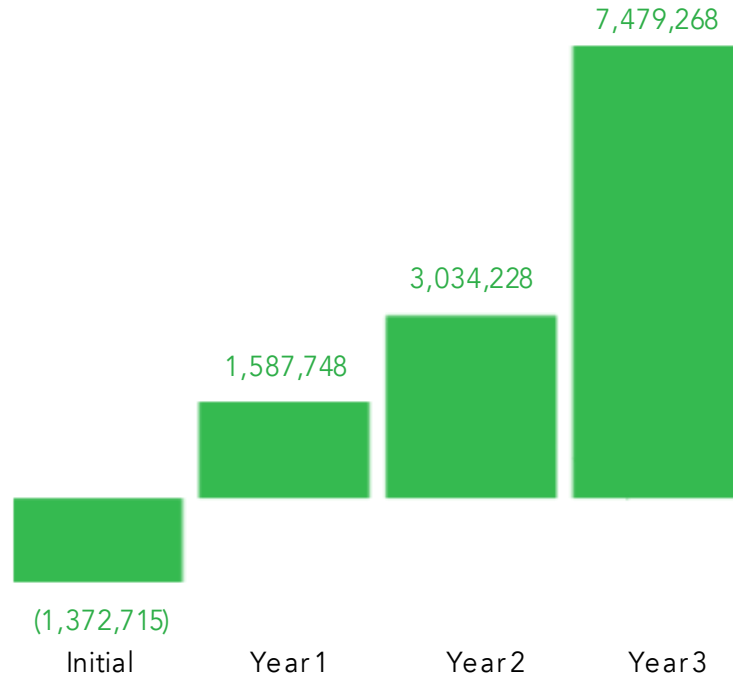
Criteo runs 100 petabytes of data at any given point in time. The ability to manage large datasets, workflow flexibility, and processing speed were critical factors in Criteo's decision to deploy Vertica. During the process of selecting analytics software, the company focused on finding a vendor that could accommodate those factors and deliver scalability in line with Criteo's growth expectations.

The Criteo team had previous experience with Vertica but still completed due diligence on several other vendors before making its choice. A company with less technical expertise would have to spend more time identifying a solution's capabilities, expected benefits, and anticipated outcomes to obtain the executive support needed to carry out a project of this magnitude.

Also, building a CoE model to identify and share best practices is an efficient method for curating an up-to-date and centralized source of expertise on products and services. With

Vertica, the CoE leader can identify critical performance indicators that may impact e-commerce businesses' ability to convert prospects in customers.

## NET CASH FLOWS



## CALCULATING THE ROI

Nucleus Research analyzed the costs of software, hardware, personnel, and user training over three years to quantify Criteo's total investment in Vertica's technology. Direct and indirect benefits were also quantified over the same three years.

Direct benefits quantified include additional revenue realized from the deployment of Vertica on top of Hadoop. Indirect benefits quantified include improved IT and management productivity achieved with the capabilities provided by Vertica. An additional indirect benefit is the creation of an analytics CoE to identify and share best practices. Nucleus calculated the time savings benefit using the fully loaded cost per hour of employees in US Dollars, converted from Euros at the current rate of exchange. Time savings were multiplied by a correction factor to account for the inefficient transfer of time between time saved and additional time worked.

## FINANCIAL ANALYSIS

**Annual ROI: 144%**

**Payback period: 2.1 years**

BENEFITS	Pre-start	Year 1	Year 2	Year 3
Direct	0	3,969,000	5,397,000	6,891,000
Indirect	0	615,681	758,481	907,881
<b>Total per period</b>	<b>0</b>	<b>4,584,681</b>	<b>6,155,481</b>	<b>7,798,881</b>

COSTS - CAPITALIZED ASSETS	Pre-start	Year 1	Year 2	Year 3
Software	832,500	1,665,000	1,665,000	0
Hardware	408,480	1,012,320	1,136,640	0
Project consulting and personnel	0	0	0	0
<b>Total per period</b>	<b>1,240,980</b>	<b>2,677,320</b>	<b>2,801,640</b>	<b>0</b>

COSTS - DEPRECIATION	Pre-start	Year 1	Year 2	Year 3
Software	0	466,200	799,200	1,132,200
Hardware	0	81,696	284,160	511,488
Project consulting and personnel	0	0	0	0
<b>Total per period</b>	<b>0</b>	<b>547,896</b>	<b>1,083,360</b>	<b>1,643,688</b>

COSTS - EXPENSED	Pre-start	Year 1	Year 2	Year 3
Software	0	299,700	299,700	299,700
Hardware	0	0	0	0
Consulting	0	0	0	0
Personnel	131,735	19,913	19,913	19,913
Training	0	0	0	0
Other	0	0	0	0
<b>Total per period</b>	<b>131,735</b>	<b>319,613</b>	<b>319,613</b>	<b>319,613</b>

FINANCIAL ANALYSIS	Results	Year 1	Year 2	Year 3
All government taxes	45%			
Cost of capital	7.0%			
Net cash flow before taxes	(1,372,715)	1,587,748	3,034,228	7,479,268
Net cash flow after taxes	(1,313,434)	(84,980)	895,599	4,853,257
<b>Annual ROI - direct and indirect benefits</b>				<b>144%</b>
Annual ROI - direct benefits only				112%
Net Present Value (NPV)				3,351,100
<b>Payback period</b>				<b>2.1 years</b>
Average Annual Cost of Ownership				2,603,505
3-Year IRR				67%

All calculations are based on Nucleus Research's independent analysis of the expected costs and benefits associated with the solution.