RESEARCH NOTE
## EXAMINING THE VALUE OF ORACLE EXALYTICS

THE BOTTOM LINE

Growing volumes of data, rising user expectations, and the need for rapid analysis are driving companies to explore technologies such as in-memory computing to deliver greater speed and performance. Nucleus found customers running business intelligence and performance management solutions on Oracle Exalytics were able to take advantage of optimized hardware, analytics software, and in-memory database technology consolidated in a single machine to accelerate time to value and increase analytics performance at a fraction of the cost of traditional approaches.

Companies continue to invest in business intelligence and analytics because of the significant benefits these technologies deliver in terms of greater visibility, increased productivity and efficiency, and reduced costs. Although Nucleus has found that organizations achieve high rates of returns on even small analytics deployments, we also found that as companies expand and extend their analytics deployments, they achieve increasing rates of returns (Nucleus Research *m17 – The stages of an Analytic Enterprise*, March 2012). The four stages of the Analytic Enterprise are:

- Automated. Companies at this stage use analytics to automate report building and construct data warehouses and data cubes to achieve benefits that include increased productivity for data experts and reduced workloads for IT departments.

- Tactical. Companies at this stage have multiple analytics deployments. They have improved data migration, integration, and data quality control, and have begun using analytics to improve decision making, rather than just increasing productivity.

- Strategic. Enterprises at this stage have deployed analytics across multiple departments and data sources, employed competency centers and advanced governance, and used analytics to align daily operations with the goals of senior management.

- Predictive. Enterprises at this stage achieve the greatest returns by proactively leveraging big data (often in real time) and reach beyond internal enterprise data to the Web, customers, vendors, and partners. They use analytics for complex and forward-looking analyses such as sentiment analysis and demand forecasting. At this stage, data sources are often large, contain a broad variety of data sets, and change rapidly.

THE STAGES OF AN ANALYTIC ENTEPRISE
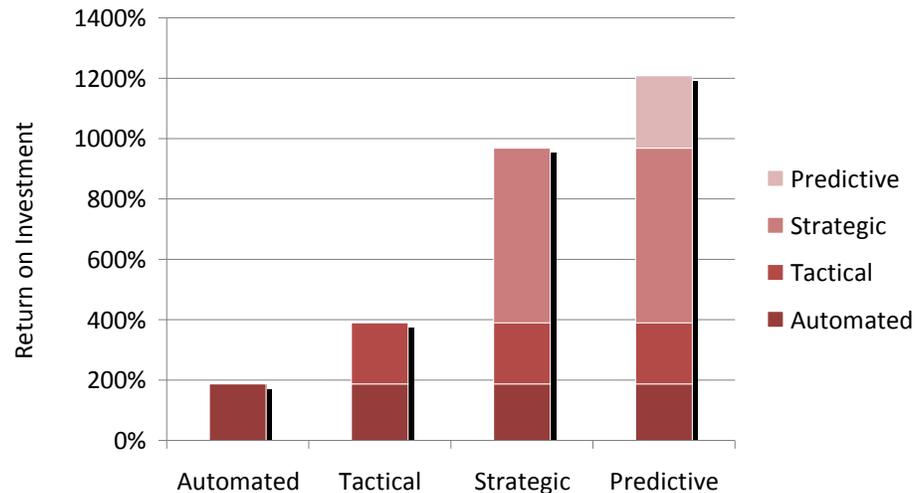
The returns from advancing an organization's use of analytics are clear. However, the increasing volumes of data available for analysis and the demands of end users for information for decision making have challenged even the most talented IT teams to deliver on analytics speed and performance requirements. Many are falling short of enterprise expectations because of:

- Data volume and diversity. As analytics deployments have been extended to access multiple data sources and applications, the volume and variety of data to be analyzed have grown.
- User demand. Analytics applications are no longer just for data experts. As companies have deployed dashboards and other data visualization tools to broader populations of business users, the number of users and frequency of queries has increased. At the same time, business users' expectations for shorter response times have risen.
- Complexity. The interdependencies between systems and applications and the potential of one patch, change, or query to have an unforeseen impact on availability and performance makes tuning and troubleshooting more difficult.

Oracle introduced the Oracle Exalytics In-Memory Machine in 2011 to address these challenges. Part of Oracle's Engineered Systems offering, Oracle Exalytics combines industry-standard server and high-speed networking hardware, business intelligence (BI) and enterprise performance management (EPM) software, and in-memory database technologies that are optimized to work together. Components of a standard Oracle Exalytics In-Memory Machine X2-4 include:

- Oracle Exalytics hardware with one TB of RAM, 3.6T of raw disk capacity, two InfiniBand ports, and six Ethernet ports.

- The Oracle Business Intelligence Foundation Suite for centralized enterprise reporting, ad-hoc queries, interactive dashboards, scorecards, forecasting and planning, what-if analysis, and scenario modeling.
- The Oracle TimesTen In-Memory Database, which is optimized for analytical processing with advanced compression and caching capabilities.

To understand how Oracle Exalytics could help organizations tackle their growing analytics challenges, Nucleus analyzed the experiences of a number of customers. We looked at the initial and ongoing costs of software, hardware, consulting, personnel, and training associated with Exalytics projects as well as the direct and indirect benefits associated with those projects.

KEY BENEFIT AREAS

Key benefits customers achieved from Oracle Exalytics included lower total cost of ownership (TCO), faster time to value, increased productivity, and improved decision making.

LOWER TOTAL COST OF OWNERSHIP

Nucleus found customers were able to meet or exceed their performance requirements at a third to one half of the initial investment that would be required for a traditional analytics architecture to deliver the same performance. This was because the engineered systems approach reduced the upfront hardware and software costs as well as the development, administrative, and support resources needed. Nucleus found key factors driving lower costs for Oracle Exalytics deployments included:

- Software pricing. The ability of customers to license analytics applications on a per-CPU basis instead of a per-user basis enabled customers to reduce their initial license costs and ongoing license maintenance costs while extending analytics to more users.
- Flexibility for capacity planning. Customers can license the software needed for an initial project and increase their software footprint over time – and only pay for more available capacity on the machine as they need it.
- Stack optimization. Because Oracle Business Intelligence and Enterprise Performance Management are engineered to work best on Oracle Exalytics systems software and hardware, companies can achieve better performance at a lower overall hardware cost than would be achieved with more heterogenous technology.
- Engineered systems. Hardware, system software, and analytics applications that are preconfigured and pretuned reduce consulting and personnel time and cost associated with selecting, provisioning, testing, and delivering analytics applications.
- Oracle support. Access to Oracle expertise and support enables Oracle Exalytics users to spend less on Oracle-specific training, personnel, and consulting. They can also depend on one vendor for problem resolution instead of having to coordinate with multiple support organizations.

Based on these factors, Nucleus found customers were able to advance their use of analytics at a significantly lower initial software and hardware cost than what would be needed in a traditional analytics environment. Customers said:

- *"In moving to Exalytics, we saved on annual license maintenance and were able to support 40 percent more users for the same price as our old architecture."*

- *"I would have to spend about twice as much upfront to get the same performance in a traditional environment."*

Nucleus found Oracle Exalytics customers were able to meet or exceed their performance requirements at a third to one half of the initial investment that would be required for a traditional analytics architecture to deliver the same performance.

Nucleus also found that customers that had existing applications built on Oracle Business Intelligence Foundation Suite including Hyperion Essbase could migrate their applications to exploit the power of in-memory database analytics technologies without changes to their existing application.

Beyond the initial investment, customers were also able to devote fewer internal resources to database tuning and analytical application support on an ongoing basis. Oracle Exalytics includes a server management infrastructure, including Oracle Integrated Lights Out Management for remote management and administration of the server hardware, enabling customers to support more complex analytical requirements with less-expensive support resources:

- *"Before we spent a lot of time trying to tune the dashboard and the database itself. Now we have just one DBA focused on tuning."*

- *"We have just one guy supporting Exalytics, because nothing breaks."*

- *"With Oracle, you get one set of tuning documents and an application that's well tuned out of the gate. The big bang for the buck is the tuned hardware that talks to the kernel and the kernel that supports the application."*

- *"Most companies don't have the greatest expert in Oracle Business Intelligence – they're not engineers but they do their best. That's where we see the engineered systems really having the advantage. The way TimesTen is implemented with Oracle Business Intelligence would have required hiring for new skills that we don't have."*

- *"With Exalytics, every quarter someone comes in and patches it up to the latest and greatest. Oracle manages it, and all the maintenance is taken care of by Oracle."*

One Oracle partner said, *"When [our customer] didn't have Exalytics the cost was exorbitant to tune and ratchet up the performance on the hardware platforms. They labored for months and spent a couple hundred thousand a year in consulting."* Nucleus estimates that on an ongoing basis, customers are able to support their analytics performance requirements at an average of one-fourth of the cost of resources that would be needed for a traditional analytics environment, because the solution requires both fewer support resources and less expensive resources.

FASTER TIME TO VALUE

Payback period – the point in time when the total costs of a project are offset by the benefits received – is an important metric because it is a key indicator of risk and flexibility (Nucleus Research *a11 - Managing risk and flexibility: A look at payback period*, April 2000). Time to value considers not just the payback period but the overall time from initial decision through development and deployment to payback.

Nucleus found customers were able to get faster, more predictable time to value because of Oracle Exalytics's engineered systems approach. Because the solution is prepackaged, tuned, and optimized for analytics workloads, the entire planning, procurement, deployment, and production process is shortened:

- *"Before we were using AIX servers and it would take four to six weeks to order machines, bring them in, then the systems administrators would get them into the data center and apply the operating system, then by the time the dba actually set up the software, you're up to 10 weeks. With Oracle, I got the machine in two weeks and within three weeks we had the machine up and running."*
- *"Before Exalytics we proposed breaking one cube into multiple cubes, which would have taken three to six months. They needed an answer today."*

> Nucleus found customers could accelerate time to value – the time from the initial purchase decision to payback – by up to four times.

INCREASED PRODUCTIVITY

Accelerated query times and faster time to load dashboards and reports, as well as better performance and mobility, enabled customers to increase the productivity of end users. Additionally, visualization capabilities including a range of interactive chart types, maps, and formats enabled users to gain better insights by consuming information in the format best suited to their role, preferences, and experience level. Customers said:

- *"Our executives had strong demand for mobile and iPad access to dashboards, and when they were on the go the pace was slow and performance was bad. Now they can access dashboards more than five times faster."*
- *"In our financial close cycle, any number of hours I could shave off the processing time helps. Exalytics is four to five times faster in access speeds."*
- *"Before, dashboards would take 40 seconds; now all our screens are well within five seconds."*
- *"They couldn't run a 10-hour process, and with Exalytics they knocked it down from 6 to 1.5 hours."*

> Customers were able to accelerate performance and analysis for end users by a factor of at least five using Oracle Exalytics; some found performance increases of 20 times.

IMPROVED DECISION MAKING

Nucleus found Oracle Exalytics enabled customers to advance their use of analytics for improved decision making by adding to the depth, breadth, and dimensionality of the data business users could analyze. Key factors driving improved decision making included:

- The ability to deploy rich and iterative financial and operational planning applications. This enabled companies to reduce planning and budgeting cycle times; improve plan accuracy by adding finer-grained operational data across the organization; and increase the effectiveness of applications such as demand forecasting, inventory management, pricing optimization, profitability management, and rolling forecasting.
- The combined analytics and scenario modeling infrastructure. This approach enabled customers to extend business intelligence capabilities from historical reporting to forward-looking modeling. Additionally, the ability to invoke business processes from within business intelligence dashboards and reports enabled faster action.
- The economies of scale of the solution. This allowed companies to tackle analytics challenges that weren't cost effective with traditional architectures, such as advanced governance, broad adoption of data visualization for business users, and self-service discovery of diverse and unstructured information from social media, Web, third party, partner, and enterprise sources with Oracle Endeca Information Discovery.

In Nucleus's analysis of the half life of data, we found that the relative value of accelerating access to and analysis of data for decision making depends on whether an organization's decision making tempo is more tactical, operational, or strategic (Nucleus Research *m36 – Guidebook – Measuring the half life of data*, May 2012). For example, the average half life of data for tactical decision makers is 30 minutes or fewer; in predominantly strategic making organizations, the average half life was 56 hours. In reality, no company makes only one type of decision, and Nucleus found early adopters of Oracle Exalytics followed a blended model of tactical, operational, and strategic decision making. Customers accelerated access to data for decision making for all three types of decisions:

- *"When running queries before, the user was waiting on the system. Now the system is waiting on the user to process the next request."*
- *"We've been able to double the history we get in a cube, and we've improved performance and increased dimensionality. With our dashboards, there's nothing in a cube that takes more than a second."*
- *"Companies patch themselves into downtime. People are always trying to patch and tune and with two or more things running against each other, performance suffers. You get a lot of management credibility when you can build predictability around performance."*

CONCLUSION

The ability to analyze vast volumes and varieties of data for decision making is a key competitive differentiator for organizations today. Although many companies have achieved returns from analytics investments, they are often challenged to advance their

use of analytics to the next stage because of the complexity of systems and limited resources.

Nucleus found that Oracle's approach of using industry-standard hardware, business intelligence and enterprise performance management software, and its in-memory database technology optimized for analytical workloads significantly reduced the complexity of supporting analytical projects. This enabled companies to reduce the initial and ongoing cost and risk of their analytics environments. It also allowed them to focus their time and IT resources on innovating and delivering more value to business users. As companies seek to manage the volumes and diversity of data that different users need to analyze across the enterprise, Nucleus found Oracle Exalytics helped them accelerate time to value and, ultimately, improve decision making.