

Leading Pharmaceutical Companies Speed Drug Discovery and Maximize Revenue Using Deep Analytics

The process for bringing a new drug to market has become increasingly complex and costly in recent years. On average, companies today spend an estimated \$1.25 billion on R&D for each drug approved, representing an increase of \$500 million since 2000.¹ Difficulties associated with recruiting and retaining volunteers and the need for more testing against comparator drugs are just some of the issues that have combined to make clinical trials more complicated than ever. And, while it typically took eight years in the 1960s to get to a new drug application, today it can take 12 – 15 years, significantly shortening the time a pharma has to maximize its revenue before its patent expires. With the amount of complex biological data increasing exponentially, the need intensifies for more insightful analysis on developmental drugs, their effects on humans and inter-drug relationships. Faster discovery and rapid decision-making aimed at accelerating medicinal and product development is imperative for pharmaceutical companies to remain viable moving forward.

While pharmaceutical companies undoubtedly strive to shorten their development cycles in order to speed their time to market and maximize their product revenue, this has largely proven to be an unattainable goal. Pharmas and life sciences organizations need to integrate very complex information and perform more costly, detailed analyses than most other industries in order to appropriately identify effects and relationships of each new drug. A multitude of organizational units generate large volumes of structured and unstructured data, resulting in data silos of research and significant data latency challenges. Methods of data storage, extraction and analysis within the organizations' disparate data management environments have grown increasingly cumbersome. To complicate matters further, most substances have several commonly used names. As the Clinical Data Interchange Standards Consortium (CDISC) works to develop and support global, platform-independent data standards that enable information system interoperability to improve medical research, pharmaceutical companies' data warehouse platforms must be similarly simplified. Sound impossible?

Imagine the Possibilities:

- Use predictive modeling to discern probable biologic outcomes
- Analyze complex algorithms and data sets without the need to segment data
- Analyze raw microarray data without the need for data aggregation and summarization efforts
- Quickly and easily analyze 2nd, 3rd and 4th degree complex relations between genes to determine true interactive disease complexities
- Combine HMMER searches with SQL database capabilities and easily search multiple organisms
- Enable predictive modeling for:
 - Protein structure prediction
 - Gene to gene and gene to environment interaction
 - Prediction of gene expression
 - Protein-protein interactions
- Provide for high value CBIR/Digital Image Analysis to enhance identification and throughput
- Replace the patchwork of computer farms, file servers, storage arrays and database servers with one powerful, easy-to-manage system

¹J.A. DiMasi and H.G. Grabowski, "The Cost of Biopharmaceutical R&D: Is Biotech Different?" *Managerial and Decision Economics* 28 (2007): 469-479.

Key Features

- Petascale analytic appliance (DBMS software, system hardware, high-speed storage)
- Asymmetric Massively Parallel Processing™ (AMPP™) architecture – Best combination of SMP and MPP for terascale, complex query processing
- Patented streaming architecture – Query functions and management implemented in silicon, with data streaming at the disk level
- Integrated (appliance) package
- Industry-standard interfaces
- Full compatibility with market-leading BI tools, applications and infrastructure
- Open platform for advanced algorithmic development

Key Benefits:

- **PERFORMANCE:** 10 -100 times faster than the competition
- **SIMPLICITY:** Fast time to deploy with minimal IT management required
- **LOW TCO:** A fraction of the cost of other analytic solutions on the market
- **LOW POWER, COOLING & SPACE CONSUMPTION:** High performance in a compact footprint

Discover Netezza

Netezza focuses on large-scale data analysis and integration by reducing the computing complexity required to manage life sciences data. The Netezza data warehouse and analytic appliance brings massively parallel supercomputing techniques to bear on complex ad hoc queries and analyses with unprecedented speed and simplicity. Classes of analyses that were impossible due to constraints imposed by traditional solutions are now enabled because of the increase in performance made possible through Netezza's unique integration of data management, storage and server into a single computing architecture.

Science and R&D Discovery

The University at Buffalo, SUNY has deployed Netezza for fast response to large-scale queries that will speed science and R&D discovery. The Netezza system was operational in one day, delivering its first query response against a test database. This project validated Netezza's fast implementation and performance as a data-intensive computing platform. The mapping of University at Buffalo's algorithm onto Netezza took one day to achieve those performance gains while the same effort took weeks on the high-performance computing cluster. The combination of quick time to value and performance gains allows researchers to address at scale many of the data-intensive discovery challenges that science is facing, enhancing disease and drug discovery research efforts. Further, using the Netezza appliance, SUNY is performing a number of scientific analysis and complex bioinformatic algorithms; HMMR and AMBIENCE, Gene-Environment Interaction Analysis for Complex Diseases like cancer and multiple sclerosis. The Netezza system delivers the ability to analyze features of importance in these datasets helping to facilitate greater understanding of the complex interactions that are taking place, leading to computational predictions and analysis into the design cycle which will reduce the development time/cost for the next generation of drug development and discovery that simply has not been cost effective or timely on existing systems.

Transform Your Business with Netezza

The Netezza appliance is a database-server-storage system designed to perform complex queries against large volumes of stored data. Performing real-time analysis on massive volumes of data with complex queries requires significantly more performance than legacy data warehouses can provide. Netezza opens the door for increased profitability. Its raw power enables timelier loading of data translating into more frequent refresh cycles, more data to use for analysis, and most importantly, faster, and better decision making to speed the drug discovery process. The simplicity of Netezza also means lower TCO, rapid deployment and significant power and cooling savings.



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About Netezza

Netezza (NYSE: NZ) is the global leader in data warehouse and analytic appliances that dramatically simplify high-performance analytics across an extended enterprise. Netezza's technology enables organizations to process enormous amounts of captured data at exceptional speed, providing a significant competitive and operational advantage in today's data-intensive industries including digital media, energy, financial services, government, health and life sciences, retail and telecommunications. Netezza is headquartered in Marlborough, Massachusetts and has offices in North America, Europe and the Asia Pacific region.

For more information about Netezza, please visit www.netezza.com.