# Big Data Analytics and The New Era of Data Warehousing

A White Paper

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# Introduction

The market for business intelligence (BI) and business analytics continues to grow – up more than 13 percent last year to reach $10.5 billion, according to Gartner[1]. This expansion shows no signs of slowing down, says analyst Dan Sommer, as "BI continues to be a technology at the center of information-driven initiatives in organizations."

The increasing need to make enterprise data analytics-ready, combined with the extended data storage and advanced capabilities now offered by vendors at lower price points, has reinvigorated interest in data warehouses and related technologies. Once available only to larger enterprises with big budgets and endless resources at their disposal, a massive shift in the data warehouse market has created a broader choice of solutions, making data warehousing initiatives more feasible for smaller and mid-market companies, as well as for departmental implementations at larger firms.

A recent survey conducted by Information Management demonstrates just how mid-market organizations are embracing data warehouses as a means of enabling business analytics. Eighty-one percent of companies polled are using or implementing a data warehouse to support traditional BI activities, while 45 percent rely on a data warehouse for operational decision-making.[2]

That same report also shows how, as advanced data warehousing functionality becomes more readily available to those outside the large enterprise arena, it is being applied to enable more cutting-edge types of business analytics. For example, an impressive number of mid-market firms surveyed have a data warehouse designed specifically for advanced analytics (36 percent) predictive analytics (29 percent), or real-time analytics (22 percent).

Gartner validates this trend toward more interactive and state-of-the art analytics in its 2010 Magic Quadrant for BI Platforms, claiming that "organizations are rapidly embracing the idea of providing data to end users, and empowering them with an ability to navigate and visualize the data in a 'surf and save' mode as an alternative to a report-only structure." [3]

In this white paper, we will discuss how customer demands have prompted recent changes in the data warehouse market, and how those changes are opening the door for a new breed of vendors beyond those who previously dominated the industry with stack offerings. As a result, companies and departments of all types and sizes can leverage advanced data warehouse solutions to facilitate effective use of innovative business analytics. We will also highlight Information Builders' portfolio of data warehousing solutions, as well as its industry partners, and demonstrate how they can help organizations easily and economically build and deploy a data warehouse in support of various mission-critical BI initiatives.

[1] Sommer, Dan; Sood, Bhavish. "Market Share Analysis: Business Intelligence, Analytics and Performance Management Software, Worldwide, 2010," Gartner, Inc., April 2011.

[2] Wise, Lyndsay. "A Midmarket Look at the Data Warehousing Landscape," Information Management, March 2011.

[3] Sallam, Rita; Richardson, James; Hagerty, John; Hostmann, Bill. "2010 Magic Quadrant for BI Platforms," Gartner, Inc., January 2010.

# The Data Warehouse Market

For years, stack vendors, such as IBM, Oracle, and Microsoft, have dominated the data warehouse market. Despite their success, these solutions are notorious for being hard to implement, complex to use, and most importantly, expensive. They have also proven to be somewhat inflexible and slow to support emerging technologies, such as cloud and software-as-a-service (SaaS).

These and other flaws have made these types of data warehousing solutions ideal only for larger enterprises that have the budgets and staff resources available to accommodate the required time, effort, and expense for planning and implementation, or to develop the needed integrations or functionality that is missing. Mid-sized and smaller organizations, or larger companies who wanted to implement a data warehouse on a smaller scale to address a departmental need, were not only confused by the countless options and sophisticated features offered by these mega-vendors, but also excluded from reaping the benefits by the extremely high price points.

For example, with a stack data warehousing solution, organizations need to purchase, deploy, and administer countless adapters, as well as an extract, transform, and load (ETL) solution, to pull data out of the repository before it can be analyzed by end users. This significantly drives up total cost of ownership, making data warehouses cost-prohibitive for mid-market companies or businesses looking for smaller, more targeted implementations. It also creates a notable lag time from a reporting perspective, hindering information timeliness and making real-time business intelligence – something that is critical for such initiatives as operational reporting – nearly impossible to achieve.

Mission-critical business analytics strategies have yielded rising demand for lower costs. Evolution in the data warehouse market to support emerging technologies like cloud and SaaS, combined with calls for greater speed and disk capacity – all at a reduced price point – have opened the door for other vendors to enter and thrive in the data warehouse market.

What does this mean for companies looking to embark on a data warehouse initiative to support the use of cutting-edge business analytics? It means that cumbersome and cost-prohibitive platforms are a thing of the past. As new solution providers gain prominence with their innovative and affordable offerings, business analytics supported by a data warehouse becomes available – and economical – for even the smallest of implementations.

[4] Beyer, A. Mark; Edjlali, Roxane; Feinberg, Donald. "The State of Data Warehousing in 2011," Gartner, Inc., January 2011.

# The Big Data Analytics Advantage

Big data is the new buzzword within the data warehousing and business analytics community. It refers to multi-petabytes of data that need ever-expanding – and more capable – databases, data warehouses, and servers.

Enterprises are privy to more and more data with increasing frequency and granularity, capturing customer interactions that include personalized demographic data from different environments. This big data triggers a need for increased storage, analytics, integration, and data quality tools. Thanks to social networking sites such as Facebook, marketers have a true opportunity to learn more about the likes and preferences of potential customers. Leveraging that information is a big data and business intelligence (BI) software opportunity to make an organization more competitive and optimize operations and performance. IDC predicts that between 2009 and 2020 digital data will grow 44 times to 35ZB[5]. Between e-commerce, banking, research, and social networking there are reams of data points for marketers and organizations to leverage. The challenge is actualizing its potential.

Big data and business analytics can create immediate value for an organization. Analytics improve an organization's performance by making everything more transparent and measurable while exposing variability as well as potential issues and opportunities. This transparency, through operational dashboards or performance management, fosters better decision-making across an organization. Using BI with big data and predictive analytics, organizations can forecast and predict customer behavior to segment markets and precisely tailor inventory distribution, products, and services. Big data analytics provides a real opportunity for organizations to innovate and grow revenue.

Think about the possibilities of real-time location data with regard to promoting coupons or specials to consumers who pass by a retailer's location. If a consumer purchased an item from Amazon, they've experienced personalized recommendations fueled by big customer data analytics. Insurance companies can analyze the data collected by electronic toll transponders to accurately determine a driver's speed, location, and mileage – and adjust insurance rates accordingly.

Utilities are at the heart of the big data opportunity. Deployment of smart meters and digital sensors/controls is leading to a 1,000-fold increase in the volume of grid and metering data flowing into a utility's IT infrastructure. A full big data analytics solution for a utility would leverage the data fed by meters to transformer, transformers to feeder, and feeders to utility – pinpointing data received to a specific area, asset, or zone. Workers can view trends in more detail. Workflow processes can seamlessly route event information and alerts for rapid follow-on actions. Communicating with external systems, the solution could automatically trigger suitable system response.

## Big Challenges

Using big data requires a well thought out information strategy that encompasses data collection, warehousing, and analytics. That information strategy should also incorporate an accurate assessment of your current IT infrastructure – systems, storage, data warehousing, applications such as CRM or ERP that digest data feeds, and analytics. Data integration and quality are other important considerations.

[5] Nguyen, Hoang. "IDC Worldwide Disk Storage Systems Quarterly Tracker," IDC, September 2010.

With big data comes a requirement to integrate, warehouse, and analyze that data. There are a variety of vendors who offer tools that meet these requirements and maximize the potential of big data.

Integrating all their databases and information assets allows organizations to centralize all their data in a single repository – such as a data warehouse. ETL software and integration adapters speed the movement of data into a warehouse. Once the data is in the warehouse, analysis can begin. Initially this would incorporate data quality and master data management. This process allows one to not only evaluate, monitor, and manage data quality in different information systems, but also to prevent incorrect data from entering these systems in the first place. This significantly accelerates the processing of sophisticated computations and other large or complex projects by breaking them up and distributing them across multiple technology assets.

Innovations in hardware and software are also allowing organizations to take advantage of big data. Server processing speed and virtualization have grown rapidly. This ensures that multiple databases, a data warehouse, and key applications such as an ERP or CRM can be leveraged for maximum business analytics efficiency.

Legacy servers and applications can see new life with big data. Integration of these assets can be achieved easily via data and application adapters and ETL tools. Making use of large datasets is not an insurmountable challenge. An organization needs a vision and strategy for optimizing its resources, data, and hardware, as well as implementing analytics. System integrators and management can determine the path for data, while software vendors armed with enterprise integration and business analytics applications can work together to realize the vision and strategy for capitalizing on big data analytics.

## Big Data at U.S. Bank

U.S. Bank helps small-business clients view their debit, Visa, and MasterCard transaction data online and run aggregate reports to track corporate spending. It used Information Builders' WebFOCUS BI platform to create dashboards and present a customized view of card payment activity, along with one-button access to consolidated statements and reports. This permits customers to review and analyze company credit card spending on a monthly, quarterly, annual, or year-to-date basis. The bank chose an inherently scalable architecture, which can support large numbers of users – via the Internet – with minimal hardware investments and IT support. According to Robert Kaufman, senior vice president in U.S. Bank's Payments Solutions division, "We are promoting the ScoreBoard as one of the tools that will help us boost the number of clients using Internet banking services to 50 percent of the customer base over time."

To accommodate the potential user base of ScoreBoard, U.S. Bank capitalizes on built-in load balancing and failover enhancements. A server can be asleep during off hours to conserve resources or awakened during peak performance times to preserve performance levels. WebFOCUS uses server resources only when accessing or processing data, while other types of BI tools require persistent connections to the reporting server, which consumes valuable server resources. Server multi-threading permits multiple users to share the same resources, eliminating the risk of server overload and allowing for greater concurrency.

# The Power of Business Analytics and Data Warehousing

Tough economic times are forcing businesses to operate in a more efficient, agile, and responsive manner than ever before. To do so, they must leverage their enterprise data in a way that allows them to anticipate and act upon trends in the market, outwit their competitors, build loyalty among customers, and enable faster, smarter decision-making organization-wide.

These requirements have led to a growing demand for advanced business analytics. Beyond simple static reports, business analytics includes such innovative and cutting-edge capabilities as predictive modeling to enhance forward-looking planning through more accurate forecasting of future events and conditions. It also enables real-time operational analysis of data in systems across and beyond the organization, including those in sales, marketing, finance, and other internal departments, as well as those maintained by customers, vendors, and other external partners. Real-time BI is the most effective way to support the kind of on-the-fly decision-making required to enable smooth, seamless frontline operations.

This kind of deep, broad-reaching information analysis cannot work without the right framework. The approach most organizations take today – which centers on the use of SQL, forcing end users to pull data and move it into Excel for further manipulation – is highly ineffective. Not only is real-time data inaccessible with this method, but the proliferation of unsynchronized spreadsheets creates information reliability issues that ultimately lead to multiple versions of the truth. This will negatively impact the quality and effectiveness of mission-critical decisions.

A successful business analytics strategy requires a singular mechanism for gathering, consolidating, preparing, and storing data from any source, in any location. Only with the right data warehousing solution, such as a comprehensive integration framework and economical and productive ETL tools, can companies ensure that their enterprise information is truly analytics-ready.

# Robust, Affordable Data Warehousing and Business Analytics Solutions

Information Builders offers a wide array of powerful, proven solutions for rapidly and economically building data warehouses that are optimized for reporting and business analytics. These products reduce costs and accelerate return on investment by tapping into the power of real-time information from across the enterprise, and making it readily available to users across and beyond the organization.

Solutions include:

**Data Warehousing Tools**
- **Data and Application Adapters –** Powered by our best-of-breed integration subsidiary, iWay Software, WebFOCUS provides comprehensive, native access to more than 300 distinct databases and information sources. This includes relational, legacy, ERP, and CRM systems, data staged in warehouses or marts, and real-time data from operational systems – on any platform.

- **iWay DataMigrator –** Fully automated extract, transform, and load (ETL) tools simplify the creation, maintenance, and expansion of data warehouses, data marts, micro marts, and operational data stores. An intuitive interface enables fast end-to-end ETL process creation involving heterogeneous data structures across disparate computing platforms.

  A change data capture feature is also available and loads only new or updated records into the target data source, dramatically reducing the time needed to refresh data, and facilitating a near-real-time data warehouse.

**Reporting, Analytics, and Data Management**
Once a data warehouse is built and deployed, Information Builders delivers a suite of advanced tools for reporting, analytics, and information management:

- **WebFOCUS –** With tools for dashboards, ad hoc reporting, performance management, complex event processing (CEP), business activity monitoring, and more, the WebFOCUS BI platform enables smarter decision-making across all levels of an enterprise. With its powerful architecture, WebFOCUS offers broad functionality, unparalleled scalability, and optimum performance.

- **RStat –** WebFOCUS RStat is the market's first fully integrated business intelligence and data mining environment, seamlessly bridging the gap between backward- and forward-facing views of business operations. With RStat, companies can easily and cost-effectively deploy predictive models as intuitive scoring applications. So business users at all levels can make decisions based on accurate, validated future predictions, instead of relying on instinct.

- **The iWay Enterprise Information Management (EIM) Suite –** The iWay EIM Suite offers tools for data quality management, master data management, data profiling, and more, to empower companies to not only access and analyze their corporate data, but also improve the way it is handled and maintained as it flows across the business. The suite goes far beyond simple data cleansing, it integrates, enriches, and transforms information into relevant and timely insight. As a result, companies can guarantee optimum quality, consistency, and completeness in their enterprise data at all times. This is particularly important in analytics-driven environments, where the accuracy and integrity of the information used as the basis for mission-critical decision-making must be ensured.

# Strategic Partners With Data Warehousing Solutions

Information Builders has joined forces with some of the data warehousing industry's leading vendors, to empower companies with low-cost, high value data warehousing solutions that facilitate the successful use of advanced business analytics.

## Teradata

This partner is a leader in data warehousing and integrated marketing management with its database software, data warehouse appliances, and enterprise analytics. Through its alliance with Information Builders, the company offers customers an out-of-the box data warehouse appliance solution – designed specifically to support advanced analytics – that delivers simplicity, rapid time to value, and peak scalability to support growing and changing needs, at a competitive price point.

This comprehensive offering, aimed at overcoming the challenges associated with large-scale enterprise data warehouses and helping companies address their information needs at the departmental level, includes the required hardware and database, as well as development, management and administration, and back up tools. It also includes adapters to facilitate rapid data movement and integration, as well as BI software to allow users to quickly begin generating reports and analyses from the new warehouse environment.

Numerous companies across all industries have benefitted from the combination of Information Builders and Teradata solutions, including:

- **Brinker International –** The company that operates such popular dining chains as Chili's and On the Border relies on Information Builders and Teradata as the foundation of a reporting environment that enables close to 4,000 restaurant owners and managers to run daily reports that provide insight into trends in attendance and consumption. This valuable knowledge about guest activities allows Brinker to better allocate wait and kitchen staff, and more precisely manage its inventory of food, beverages, and liquor to avoid shortages and surpluses

## ParAccel

This company developed the ParAccel Analytic Database (PADB), the world's fastest, most cost-effective platform for empowering analytics-driven businesses. When combined with the WebFOCUS BI platform, ParAccel enables organizations to tackle the most complex analytic challenges and glean ultra-fast, deep insights from vast volumes of data. With WebFOCUS and ParAccel, companies can answer critical, time-sensitive questions beyond the scope of conventional data warehouses and existing analytic tools. One of the companies that leverages this partnership is:

- **Dealer Services Corporation –** America's largest independent inventory finance provider for used cars chose WebFOCUS and ParAccel to support a major enterprise resource planning (ERP) reporting initiative. Interactive dashboards are used to display performance-related information, while predictive analytic technologies are applied for forecasting revenues and market trends. With the help of Information Builders and ParAccel, Dealer Services has increased profitability by anticipating and reacting to pending factors that will affect the business

### 1010data

Information Builders and its partner 1010data, a provider of high-performance hosted data warehouse solutions, are improving customer analytics and lowering the costs associated with BI-driven data warehousing initiatives. 1010data offers a data and analytics platform that is the only complete approach to performing the deepest analysis and getting the maximum insight directly from raw data, at a fraction of the cost and time of any other solution. 1010data's extensive history in BI and data warehousing has enabled the company to create this powerful solution as a service.

Information Builders customers can leverage 1010data's namesake hosted database as their enterprise data warehouse. This improves the performance of WebFOCUS by tapping into the speed and performance attributes of the 1010data analytical engine, to enable fast and reliable querying of detailed data.

1010data and Information Builders enable retailers to improve store site selection, merchandising, inventory effectiveness, product level assortments, promotional planning, and customer loyalty programs. Joint customers include:

- **Dollar General –** When poor decision-making was negatively impacting company growth and expansion, Dollar General implemented a comprehensive solution built on WebFOCUS and 1010data. A new business intelligence environment for sales, inventory, and store performance management has given a substantial boost to the company's bottom line by making it easier to generate the reports needed for successful decision-making

- **AutoZone –** 1010data and Information Builders have empowered AutoZone, the nation's leading distributor and retailer of automotive replacement parts, to roll out operational reporting to more than 4,000 stores. Tens of thousands of users have immediate access to timely and complete information about everything from HR training and annual reviews to store operations, wholesale sales support, and customer satisfaction. As a result, the company can more rapidly and effectively respond to the needs of its customers and the market

### Netezza

Information Builders and Netezza, a leading developer of combined server, storage, and database appliances designed to support the analysis of terabytes of data and provide companies with a powerful analytics foundation that delivers maximum speed, reliability, and scalability. When coupled with the WbFOCUS BI platform, the Netezza Performance Server – which brings storage, processing, database, and analytics together into a single system that has been proven to improve query performance by 10 to 100 times – offers enterprise-ready business intelligence, predictive analytics, integration, and data governance to promote better decision-making across an organization.

- **Helzberg Diamonds –** Leading fine jewelry retailer Helzberg Diamonds built a robust BI environment with Netezza and WebFOCUS as the foundation. Store managers and other company decision-makers can now make better sense of the huge quantities of point-of-sale data collected by analyzing it via intuitive reports, scorecards, and dashboards. Better information flow across stores and corporate offices, as well as improved data analysis capabilities, have given stakeholders at Helzberg the insight they need to respond swiftly to market trends, and improve productivity in nearly all facets of the company's business

## Vertica

This HP company is the leading provider of next-generation analytics platforms that deliver unmatched scalability and flexibility, performing 50 to 1,000 times faster than traditional solutions – at 30 percent the cost. Vertica customers who extend their solutions with WebFOCUS can conduct deep business analysis, including predictive modeling, from data contained within their Vertica platform.

# Conclusion

The data warehouse market continues to evolve with the emergence of a new breed of vendors that make data warehouses easier to acquire, implement, and administer. Companies are also placing an increasing emphasis on their business analytics strategies. As a result, more and more organizations will be deploying data warehouses designed specifically to support advanced analytics initiatives.

Information Builders offers the market's widest array of data warehousing, business intelligence, and advanced analytic tools. Businesses can deploy analytics-ready environments, complete with cutting-edge capabilities for predictive modeling, ad hoc reporting, and more.

Information Builders has also partnered with proven leaders in the data warehouse market. Through these alliances, companies of all types and sizes can take advantage of today's most powerful, reliable, and scalable data warehousing environments for high-performance reporting and analytics.

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