Business Innovation and Optimization solutions
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Improving business performance with information management.

ON DEMAND BUSINESS™

Contents

The target audiences for this white paper are IT managers and architects who are looking for a solution to improve the analysis of business process-related information, to turn this information into actionable insight, and to ultimately improve business performance.

Introduction

According to a recent IBM study, 80 percent of CEOs indicate that top-line revenue growth is back on their corporate agenda. However, CEOs want to conduct growth initiatives in a more focused and controlled manner than before. This requires a stronger alignment of corporate strategy and business goals with core business processes and metrics. As such, the IT infrastructure must reflect, and help to achieve, the business objectives by delivering visibility into the core business activities. It also demands improved responsiveness in order to act immediately on changes or deviations from planned targets.

Business Innovation and Optimization solutions address these challenges. Businesses are able to respond to clients' needs, competitors' actions and regulatory changes by building aligned, accountable, action-oriented organizations. From strategy to operations, this alignment is based on an integrated set of business capabilities that leverages all relevant people, information, processes and assets.

To support alignment, accountability and coordinated action, Business Innovation and Optimization provides a disciplined methodology and a software architecture. The architecture is based on a service-oriented architecture design and supports a convergence of key integrated capabilities of business service management, information management, process management and business portal environments. Business service management gives insight into the status of the IT operational infrastructure. Process management supports the modeling, simulation, execution, monitoring and adaptation of processes. A portal realizes the user interface through role-based dashboards. This paper will focus on information management for Business Innovation and Optimization and will describe its value, components and contribution to managing business performance.

Highlights

Information management, which transforms information into actionable insight to ultimately improve business performance, requires a resilient, flexible infrastructure.

In a Business Innovation and Optimization solution, the business strategy builds the foundation for consistently modeling the business process and key performance indicators.

Information management puts information in context, enabling easy, on demand access to and correlation of diverse business information.

The information management infrastructure for Business Innovation and Optimization

Leveraging cross-organizational initiatives such as business process management and business intelligence places daunting requirements on an organization's information management infrastructure—from the volume of data collected, to the dynamism of the metrics. The infrastructure must provide resiliency and flexibility in an ever-changing world. Information management transforms information into actionable insight to ultimately improve business performance. Information management serves several key purposes in the context of Business Innovation and Optimization:

- ***It collects and warehouses business metrics to provide historical context and a basis for pattern analysis.***
  In a Business Innovation and Optimization solution, the business strategy builds the foundation for modeling the business process and key performance indicators in a consistent and aligned manner. The key performance indicators help to track and control the progress toward the business strategy and goals. However, the collection of information to calculate the measures and to provide sufficient context for analysis in root causes or for the discovery of optimization opportunities can be a daunting task. Some measures can be derived from business process events. In other cases, consolidation technologies extract, clean and aggregate the information from a variety of operational systems. A warehouse is a scalable platform for collecting this vast amount of information and keeping the history of key metrics. Analytical tools and applications can then access this historical context from the warehouse.

- ***It puts information in context, through easy, on demand access to and correlation of diverse information (structured and unstructured).***
  Access includes historical performance, real-time events and planned targets necessary to calculate performance metrics and assess whether action is necessary. Real-time, contextual insight requires the correlation and integration of historical context with real-time data such as process-monitor events.

Highlights

Business intelligence services transform information into insight through rich analysis, visualization and reporting.

- ***It delivers in-line analytics and business intelligence services for applications and business processes.***
  When measures deviate from planned targets, business analysts employ business intelligence tools to investigate the root causes so that necessary actions can be taken. Business experts and analysts are also using business intelligence services in order to identify optimization opportunities to further improve the overall process. The warehouse provides the necessary context for the analysis. The business intelligence services then transform this information into insight by providing rich analytical, visualization and reporting capabilities. A Business Innovation and Optimization environment that embeds in-line analytics with business applications aligns the underlying process with the analysis and the user interface to take actions. In that way, in-line analytics are essential to providing actionable insight.

- ***It provides standard SQL-, XML- and Web services-based interfaces.***
  Integrate seamlessly with industry-leading analytical and reporting tools, portal infrastructures and service-oriented architectures.

Together, information management capabilities provide a foundation for an On Demand Business to make action-oriented business decisions.

Together, these capabilities provide a foundation for an On Demand Business to make action-oriented, context-based decisions.

Before going into more detail, consider this IBM example: IBM's CEO dashboard gives IBM managers visibility into key business metrics. These metrics measure and report on the end-to-end business cycle as well as individual business processes. Process targets are tightly aligned with company goals, and dashboards are tailored to the responsibilities of individual managers, from the CEO through operational managers. Managing key performance indicators for individual processes enables managers to identify potential problems early on and to take corrective action before the problems negatively impact performance. The infrastructure to support this business management system includes a variety of data warehouses, federation services to bridge regional warehouses and allow access to real-time information, and an environment that displays the key metrics to the managers and enables their further analysis of the issues and corrective action.

Highlights

Moving from fact-based to context-based decision-making is a key objective of Business Innovation and Optimization.

The following sections describe in more detail the key purposes of information management for Business Innovation and Optimization.

Collecting and warehousing business metrics for analysis

A key objective of Business Innovation and Optimization is to move from fact-based to context-based decision-making. The information used to build the historical context is typically distributed over heterogeneous systems. To facilitate extensive analysis and build historical context, businesses calculate and consolidate key metrics, along with their underlying transaction or operational data, into a data warehouse. Consolidation helps maximize data-access performance and availability. The warehouse facilitates analysis by gathering together all facts related to a particular subject area. It supports both broad historical views for trend and pattern analysis as well as point-in-time snapshot views, such as close of business, for analytical consistency. In a growing number of cases, the warehouse also serves as a platform for analytic functions that are optimally performed close to the data, such as data mining, transformations, aggregations or statistical algorithms. Warehousing should be a standard element of most performance management infrastructures, but it is mandatory when:

A consolidated data warehouse facilitates analysis by gathering together all facts related to a particular subject while maximizing data access performance and availability.

- *Complex transformations are required to achieve consistent data.*
- *Large amounts of data need to be integrated and made available for fast access.*
- *Complex analysis, such as data mining runs, will scan through large volumes of data.*
- *Data needs to be collected in order to establish a history of information.*
- *Any kind of trend analysis is desired.*

Highlights

By leveraging a data warehouse to scan, sort, join and aggregate data, information management technology helps streamline and standardize data.

The data that an information warehouse delivers to higher-level services (presentation, reporting and other information services) should be refined to the desired level of granularity. By leveraging the data warehouse to scan, sort, join and aggregate data, information management technology helps:

- *Shift "heavy lifting" work to a solution layer that is optimized to perform that work.*
- *Minimize the amount of data that flows over the network.*
- *Minimize data exposure to security outside the firewall.*
- *Avoid the data inconsistency that occurs when separate engines apply separate algorithms to measure the same business information.*

Emerging interest in real-time business intelligence strategies may drive requirements for additional infrastructure, such as an operational data store. The operational data store typically holds transaction detail for a defined recent period, for example, the previous 24 hours. It is populated on a more frequent basis, ranging from multiple times daily to continuously, and is accessed by operational applications or users. In more cases, the operational data store appears as a logical construct or sub-schema within the consolidated data warehouse.

Database infrastructure for the warehouse or operational data store will affect the performance management at higher layers of the framework. Scalability, platform portability, extensibility and manageability are key attributes that combine to differentiate data warehousing systems from different vendors. New performance management workloads introduce unique requirements around latency, integration and analytic function in the warehouse database.

The data warehouse, which manages enterprise-wide historical context, is a key component of the Business Innovation and Optimization architecture.

The data warehouse is a key component of the Business Innovation and Optimization architecture. It manages enterprise-wide historical context, which is the foundation for analysis. Differentiated characteristics of the warehouse database enable the Business Innovation and Optimization solution to provide a high quality of service and ultimately allow the business to have all the information at the right time.

Highlights

Building the data warehouse requires the appropriate infrastructure for populating the warehouse and for providing warehouse security and access.

Building the warehouse requires the appropriate infrastructure for populating the warehouse and for providing warehouse security and access. Regarding the former, ETL (extract, transform and load) technology executes batch-data movement on a defined schedule and within a target timeframe. This typically involves large volumes of data and often requires extensive transformation and the application of solution-specific data-quality services. Information within the warehouse is typically maintained for years. The more frequent the population requirement, the more likely will be the requirement for an event-based data-movement infrastructure, such as database replication. Besides population and replication, data federation is another key information-integration technology for Business Innovation and Optimization. The next section will discuss this particular capability in more detail.

Easy, on demand access to diverse information

Responding effectively to business events requires that users have all the related data—in the correct context—at hand to make informed decisions.

Responding effectively to business events requires that users have all the related and relevant data at hand to make informed decisions. Business events must be understood in a larger, potentially enterprise-wide, context. For example, a current loan application can be correlated and compared with both current activity (other applications by the same consumer or same institution) and historical performance (past loan performance by the same consumer or same institution, or loan performance by institutions with similar credit histories).

Data-federation services allow analytical tools or applications to access all relevant information as if it were in a single database. Federation allows this historical perspective to be readily compared, correlated and combined with real-time information such as process-monitor events. While skepticism about access performance lingers, high-end features such as distributed query optimization and caching make federated data access viable for real-world performance management scenarios. Together, federation and data warehousing facilitate the correlation of real-time events with trends and goals and the tracking of business metrics.

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Federation provides integrated access to real-time business events, historical data from the warehouse, and other relevant data or content. By integrating monitored events with historical context in real time, enterprises improve their responsiveness, allowing them to become predictive instead of merely reactive.

Together, federation and data warehousing facilitate the correlation of real-time events with trends and goals and tracking of business metrics.

Federation often yields low-cost implementations, especially for situations when a relatively small and frequently changing subset of information must be retrieved out of a large amount of data. In the replication approach, the presence of multiple copies results in high costs, whereas federation only pulls the required information on demand. Federation supports a wide range of data and content sources, and the capability can be extended to virtually any information source.

Federation virtualizes the "single version of the truth" data warehouse, playing a key role in putting events into meaningful context.

Business Innovation and Optimization links the analytical insight of business intelligence practices with the dynamic, real-time monitoring capabilities of business process and service management.

In-line analysis and business intelligence services deliver actionable insight

Business Innovation and Optimization links the analytical discipline and insight of business intelligence practices with the dynamic, real-time monitoring and action-oriented capabilities of business process and service management. Business intelligence adds context—consisting of historical depth and subject-area breadth—to real-time business measures. For example, business intelligence helps to explain if a sharp intra-day spike in a key performance indicator represents a critical business anomaly or a normal daily cyclical pattern. The graphical manipulation and visualization of and interaction with fact-based analytics helps users understand historical data, real-time events, emerging trends and evolving patterns.

Highlights

In the Business Innovation and Optimization environment, business intelligence facilitates the creation of process-specific reports and in-line analytics, as well as the use of data exploration tools for mining or profiling atomic-level data. Dashboards and scorecards also visualize higher-level performance indicators, such as financials, clients, suppliers, markets, channels, products, profit, and myriad combinations of these, as warranted by business process scope.

Business Innovation and Optimization solutions enable corrective or preventive actions in a timely fashion by monitoring and analyzing process performance metrics in real time.

Business Innovation and Optimization solutions monitor and analyze process performance metrics in real time, enabling corrective or preventive actions in a timely fashion. As a result, the business can measure the success of individual process stages and can take actions in a forward-looking manner. For example, the alignment of the executive dashboard with the underlying end-to-end process, including the sales process, allows the tracking of key metrics along each step, from sales opportunity identification, to closing the sale, through delivery of the product or service. With the insight gained from analysis of unexpected results in early phases, executives can take appropriate action, such as deploying new processes in order to achieve the initially planned target.

Information management reporting is "role-based" in that users will see the appropriate information based on their roles.

Information management reporting is "role-based" in that users will see the appropriate information based on their role. For example, executives will see status indicators of top-level metrics, whereas financial analysts will see information relevant to them. Each role will be able to drill down beneath the surface of the metrics presented to them to access more analytical detail.

In-line analytics are analytical components that are in line with, or embedded in, application logic to determine process or application efficiency. For example, IBM DB2® Alphablox® provides modular analytical components that can be embedded in applications to juxtapose rich visual analysis with traditional aspects of the application user interface.

Highlights

As is apparent from the above discussion, analysis is one of the core activities of Business Innovation and Optimization. Relying on defined processes and metrics, managers must understand the current state of the business and business trends. Information analysis services provide the investigation tools to transform the vast variety of information into insight. As a result, users can determine problems, identify performance opportunities, align resources and ultimately transform their business. Analytical services may include:

By providing tools to transform information into insight, information analysis services can provide users with information they need to transform their business.

- *Statistical analysis—based on mathematical functions such as regression, co-variance and standard deviation—to enhance data with business insight.*
- *Multidimensional analysis to quickly access different perspectives and drill down to details.*
- *Scoring techniques based on data mining models to associate information with specific categories or behaviors (for example, grouping clients or classifying suppliers).*
- *Data and text mining to detect patterns linked to results or behaviors. Data and text mining examples include:*
  - *Clustering by segment and profiling information related to the clustering process.*
  - *Discovery of associations among events or process observations.*
  - *Revealing sequential patterns derived from repeated events.*
  - *Classification algorithms.*
  - *Predictive algorithms to score business insight factors, such as likelihood of fraud, credit risk and propensity to buy.*

Information management components provide interfaces that are compliant with industry standards so the client can integrate preferred providers with optimal cost and speed.

Open-standards-based interfaces to integrate with analytical tools, portals and service-oriented architectures

Standards and an open infrastructure are critical for clients seeking to leverage existing IT investments. Information management components provide interfaces that are compliant with industry standards so the client can integrate preferred providers with optimal cost and speed. Key interfaces include

Highlights

IBM is best positioned to deliver the information management infrastructure for Business Innovation and Optimization through its proven expertise, technologies and integrated platform.

SQL, Web services, Java™ Database Connectivity (JDBC), Open Database Connectivity (ODBC), XML and Predictive Model Markup Language (PMML). Information management participates in a service-oriented architecture as a consumer and provider of services that are described in this paper.

Conclusion

Business Innovation and Optimization helps organizations become more aligned, accountable and action-oriented in order to achieve their business goals. Information management capabilities play a key role by transforming distributed and diverse information into actionable insight. Collecting and warehousing business metrics creates the historical context and a basis for pattern analysis. Federation capabilities correlate diverse information including historical performance and real-time events and planned targets to put information into context. In-line analytics and business intelligence services facilitate detailed analysis closely linked to the process in order to accelerate response to potential problems. Industry standards allow clients to leverage existing technology investments and to choose their preferred providers.

IBM is best positioned to deliver the information management infrastructure for Business Innovation and Optimization through its proven expertise, innovative technologies and integrated platform that lets clients extend the value of existing investments and address performance issues at their own pace.

For more information

Please contact your IBM representative or IBM Business Partner, or call 1 800 IBM CALL within the U.S. To learn more, visit:

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