Bizcovery Foundation

A Complete Platform Solution for Business Intelligence and Analytic Applications

Technical Overview

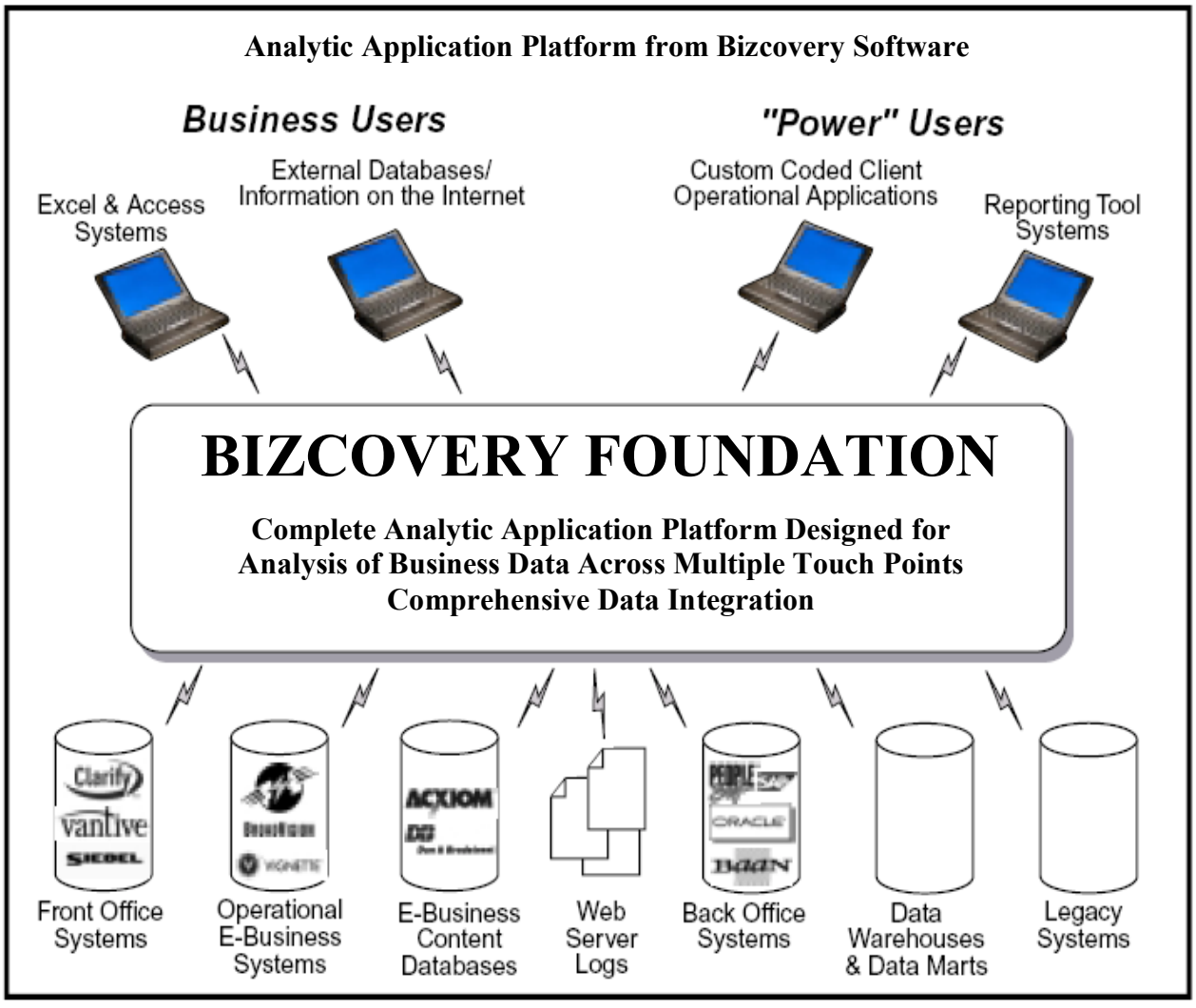
Bizcovery Software, Inc.

INTRODUCTION:
A COMPLETE SOLUTION

Bizcovery Software, Inc. is a leading provider of business intelligence and analytic application platforms. Using Bizcovery products, companies can

- Implement complete BI/Analytic applications in the shortest time possible.
- Integrate enterprise data from multiple systems and have the data ready for analysis within the time window.
- Adjust the applications to changing business requirements and changing IT environment.
- Afford the resources and money required to implement a comprehensive BI/Analytic application.

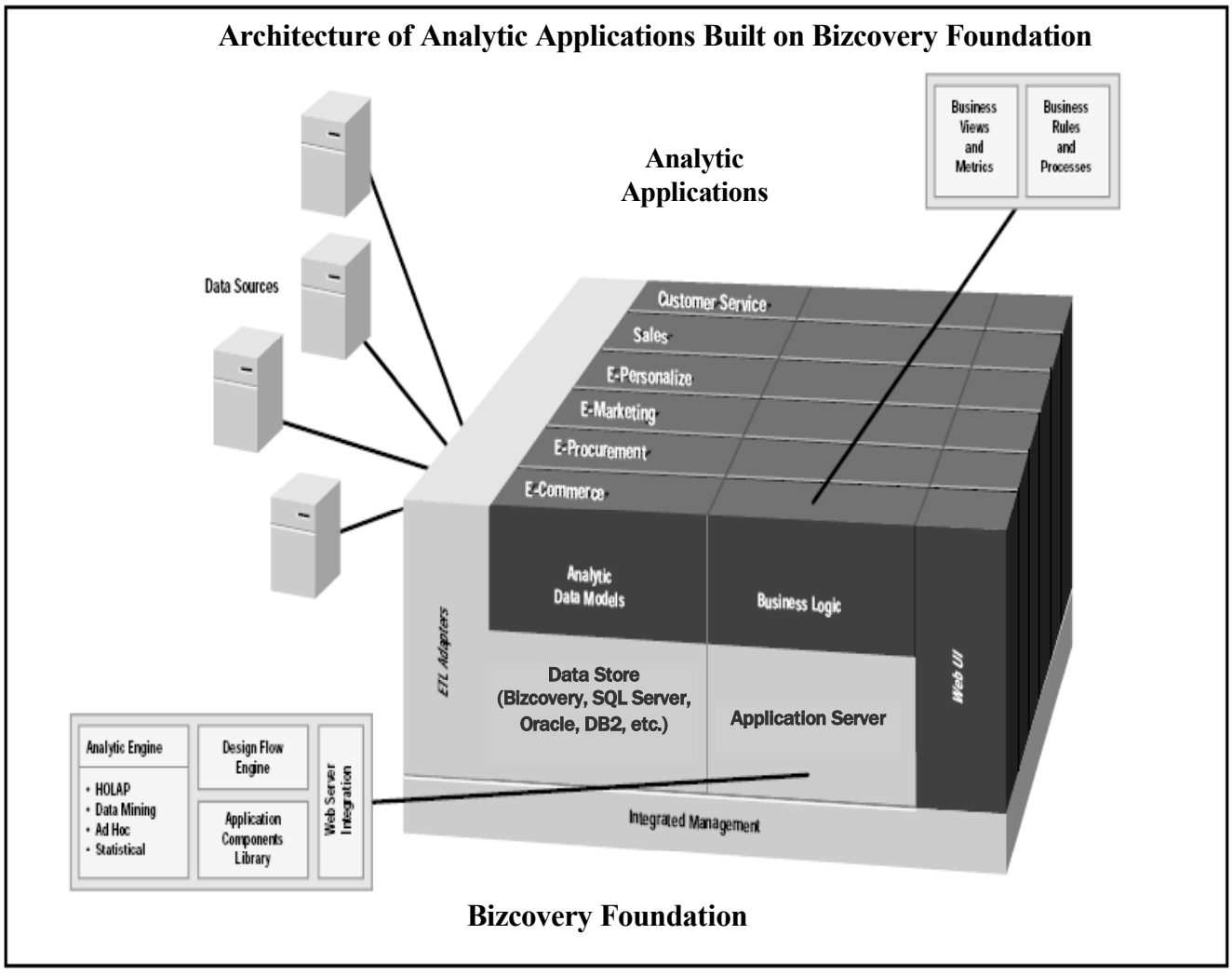
Today, both traditional "bricks and mortar" companies and companies doing business online are using Bizcovery's software to increase profitability, productivity, and customer value.



The Problem (an E-Business Example): Convert Digital Data into Digital Capital

In today's increasingly competitive environment, businesses require customer-centric business analysis to provide a comprehensive understanding of their individual customer relationships. E-Businesses need to gather, evaluate and act on customer information gathered from all channels, including storefronts, catalogs, websites, marketing and customer service (i.e., FAQ usage, call-centers, etc.). E-Businesses face the following questions/problems:

- "How do I get a complete view of the customer across multiple touch points without consuming a lot of time and money in integrating customer information from my multiple systems?"
- "What is the profile of customers shopping the web channel versus other channels? How would it affect my merchandizing and marketing strategies across these channels?"
- "I run a distributed support center environment. How do I get a consolidated view of the performance and utilization of various support centers, so I can make better resource decisions?"



The Solution:
Bizcovery Analytic Application Platform Technology

Bizcovery Analytic Application platform provide the infrastructure to implement solutions that address the above-mentioned issues. By utilizing continuous feedback on customer intelligence, Bizcovery allows companies to maximize profitability throughout the customer life cycle.

- **Complete Multi-Touch Point Solution.**

  The ability to integrate data from multiple points or sources of information is a key advantage of the Bizcovery solution.

  Bizcovery facilitates analytic applications to integrate and analyze customer interactions and operational data from multiple data sources, including third-party customer demographic data providers, front and back office enterprise software applications, other custom and legacy systems and enterprise data warehouses.

- **The Most Comprehensive End-to-end Analytic Application Platform**

  Instead of requiring organizations to undergo the costly and lengthy process of integrating point-solutions, Bizcovery's integrated technology allows for rapid implementations and deployments. The Bizcovery Foundation architecture may be logically separated into several architectural modules. The Bizcovery Foundation components include the ETL (Extract, Transform and Load) layer, data store, application server, ADP (analytic design platform), and the integrated management environment.

Building BI or Analytic Application on Bizcovery Foundation

Bizcovery Foundation is a robust ETL, data warehouse / data mart and analytic application platform. Applications built on Foundation can include the adapters (ETL layer), data store, application server, and the integrated management environment. The architectural components of applications built on Foundation are described below.

Adapters and ETL Layer

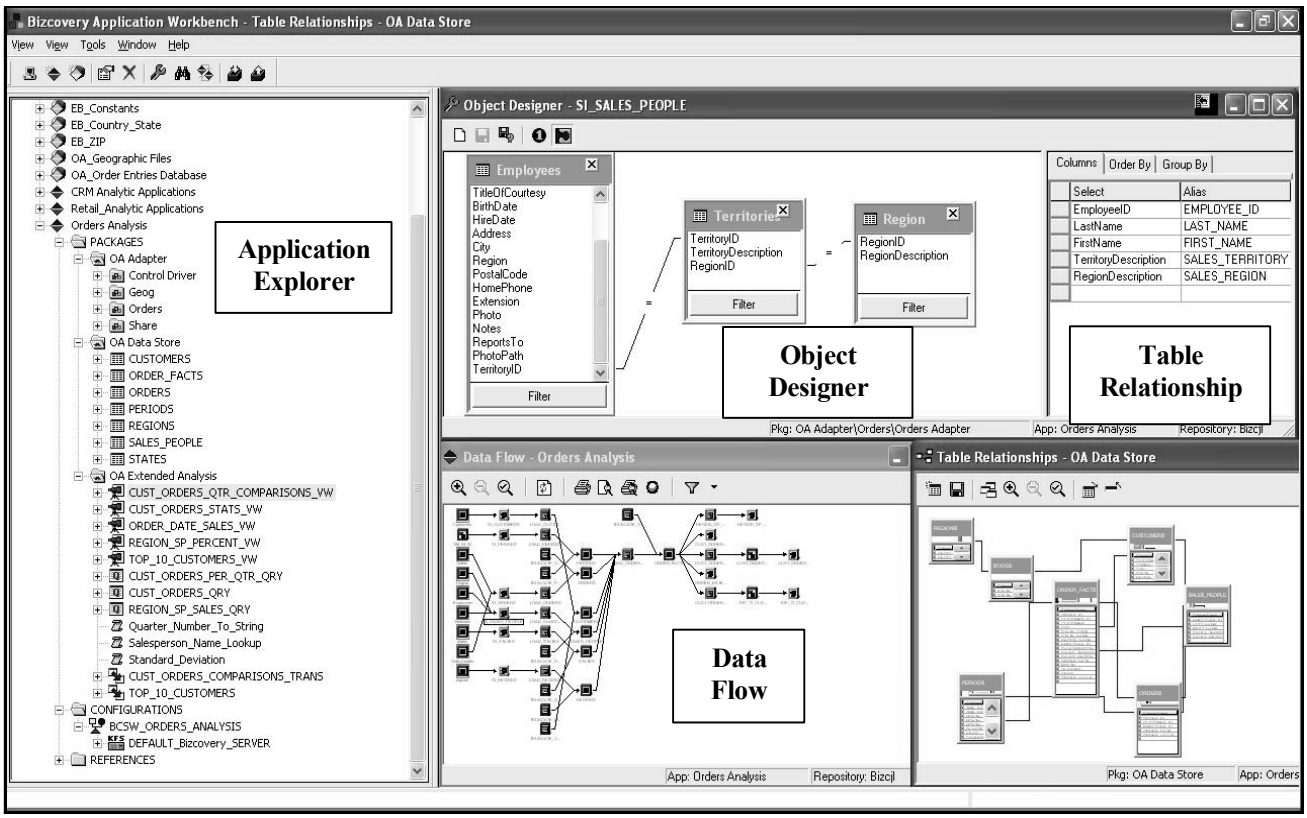
Bizcovery Foundation features an adaptive layer for robust data extraction, transformation and load, or ETL, capabilities, including data cleansing and data mapping. Through the robust connectivity layer, adapters to e-business, financial and customer data may be "melded" to achieve a complete business view of an entire enterprise.

Powerful ADP (Analytic Design Platform).

Building a complex analytic application that can provide business view from all angles for various subjects requires

- pulling data from multiple data sources
- building complicated data transformations for both at the column level and at the table level
- team work for co-development
- debugging for high level issues and issues at deep sub-query and transformation level
- provide tracing for where data comes from and where data flows to
- version control and comparison for different revisions of applications
- code review and performance tuning
- deployment to heterogeneous

Bizcovery Foundation Analytic Application Design Platform (ADP)



environment to support multi-tier dev/QA/production IT infrastructures

- faster time-to-market with incremental development and deliveries to allow narrowing the gap between technical deliveries and business requirements

Bizcovery Foundation ADP is designed to solve all above mentioned issues and is built on top of a very rich metadata layer.

Adapters. The adaptive ETL layer allows integration with key enterprise, e-business systems, and customer data sources. Bizcovery Foundation may be integrated with e-commerce systems such as those offered by BroadVision, InterWorld, Vignette, Open Market and Microsoft Site Server; customer interaction systems such as those offered by Oracle, Siebel, PeopleSoft, Clarify, Onyx, Saratoga, Scopus, Aurum, and Pivotal; enterprise resource planning applications such as those offered by SAP, Oracle, PeopleSoft, Baan and JD Edwards; custom, legacy and homegrown applications and systems; external demographic data providers such as Acxiom and Dun & Bradstreet; and leading enterprise data warehouses such as those offered by Oracle, Sybase, Informix, IBM and NCR. Bizcovery also provides the ability to integrate data from legacy systems and custom systems including flat files and spreadsheets.

Library of ETL Transformations. The Bizcovery ETL solution incorporates Java classes to transform data and automate processes (see "Use of the Java Programming Language" section for details).

Because transformations are not coded as stored procedures, which are specific to particular databases, the ETL solution may be used with any database. Thus, the Java based transformations allow for a completely open ETL solution.

Extraction and Pooling of Data. Bizcovery ETL transformations are not only used to extract data from operational databases. The transformations are also used to "pool" data from these systems in a staging area (staging tables) located in the application data store.

Historical Reporting. Bizcovery can incorporate historical data tables in the application data store in order to capture historical trends and to allow for historical reporting of information. These tables pool historical information from the various operational systems in order to give users a complete view of the customer life cycle.

Incorporating Real Time Data for Real Time Decision. In Bizcovery, because transformations are not coded as stored procedures, decisions and alerts based on both real time and historical data are possible.

Data Cleansing and Management. As the transformations extract data they also serve an important data-cleansing role. Bizcovery eases the reformatting and cleansing work for the data extracted from operational systems, so that the data may be properly analyzed in the Bizcovery system. In addition, semantic changes are also made to data columns. For example, a column in a sales system named "NL-Sales" would be automatically translated to a more easily understandable title, "Actual-Sales".

Notification on Content Changes. In a lot of BI/Analytic applications, business rules may need to be modified if the data content in certain OLTP tables varies. Using transformations provided in Bizcovery's ETL engine, combination of set operations and E-Mail notification can act as an agent to detect content changes in OLTP tables.

Bulk and Incremental Loads. Bizcovery provides the ability to perform bulk and incremental data loads. Bulk loads are commonly performed for the first extraction of data from operational systems. After the first bulk load extraction is performed, incremental loads may be performed. Incremental loads only extract new data and are therefore faster and more efficient. Bulk load and incremental load functionality provided by Bizcovery ensures efficiency of the on-going data extraction process.

Scheduling and Triggering Extraction. The Bizcovery integrated management environment allows customers to schedule ETL operational system extractions on a weekly, daily, or hourly basis. Actions performed by users in the Bizcovery system may also be directed to trigger a data extraction. The Bizcovery ETL transformations handle all of this functionality.

Bizcovery's unique and powerful adaptive ETL provides businesses with the flexibility to integrate other data sources and systems as businesses change.

Open Data Store

The data store within the Bizcovery Foundation environment is a robust and open data repository.

An Open Solution. The Bizcovery data store is optimized for analysis. It is a completely open solution and supports any database that supports an ODBC connection, JDBC connection, Oracle OCI, Java, etc.

Supports Distributed Computing. Bizcovery supports distributed computing by allowing different analytic applications or application platform components to be distributed to different servers in different physical locations. This feature allows

separation and deployment of the total Bizcovery analytic solution to separate servers in order to optimize system performance. For example, Bizcovery data stores may be distributed to servers in Europe and the U.S. in order to accommodate peak usage times in each region.

Supports Heterogeneous Environments. Bizcovery also allows different analytic applications to "push" or "pull" data from different types of data stores. For example, a customer may wish to deploy the Bizcovery Sales module to an MS SQL Server data store because their instance of Clarify is currently deployed to an MS SQL Server database. However, this customer may also wish to deploy the Bizcovery E-Commerce module to an Oracle data store. Bizcovery Foundation allows this combination of heterogeneous data stores.

This feature provides great flexibility and is especially beneficial in corporate mergers in which the merged corporations' front and back office operational applications reside on a heterogeneous set of databases. Corporations with departmental IT groups that have different database standards also derive significant benefit from Bizcovery's heterogeneous data store functionality.

Supports Data Export to Reporting Tools. Bizcovery may be implemented to coexist with reporting tools through the open data store. Technical power users may access Bizcovery's application specific data models in the data store to perform analysis and create complex reports using reporting tools such as Cognos, Business Objects, Microstrategy, or Actuate. Data may be exported from the open data store to these reporting tools. In this way, Bizcovery applications enable a new class of business user to perform analysis, and enhance the utility of reporting tools without restricting traditional power users from performing department specific analysis.

Diagramming Tool Integration. Diagramming tools (e.g., Visio) may link to the Bizcovery data models to allow administrators to view data model structures.

Through distributed computing capabilities, support for heterogeneous environments and database and reporting tool integration the Bizcovery data store is the most flexible, robust and open repository in the market today.

Application Server

The Bizcovery application server consists of four main components/functions: the analytic engine, decision flow engine, application components library, and web server integration.

Each of the four components that make up the application server interacts to provide seamless and streamlined delivery of analytic data from the Bizcovery data store to the application modules. The following sections describe the purpose of each component and the various benefits that the Bizcovery application server architecture provides Bizcovery analytic applications users.

Analytic Engine. Bizcovery Foundation features a powerful analytic engine, with capabilities including hybrid online analytical processing (HOLAP), data mining, publish and subscribe capability, statistical and ad hoc analysis.

HOLAP Solution. Bizcovery Foundation provides a robust platform for performing HOLAP (Hybrid OLAP) analysis. Bizcovery supports both ROLAP (Relational OLAP) and MOLAP (Multidimensional OLAP) analysis unlike many analytic application vendors on the market. The Bizcovery solution has advanced ROLAP functionality by supporting Microsoft Analysis Server with end-to-end metadata integration.

This feature provides two important benefits:

(1) greatly increased scalability and

(2) flexibility of data volume and analysis.

Data Mining and Statistical Analysis. Algorithms such as top N, N-tile, propensity, affinity analysis, and induction are included as part of Bizcovery standard functionality. These algorithms are built entirely in C++, Java, and SQL and are compartmentalized for reuse in applications.

With Bizcovery Foundation, one can quickly create a new analytic application that answers critical business questions.

Standard and Ad-hoc Reporting. Ad hoc queries may be performed through a simple "drag-and-drop" process. Bizcovery "active" ad hoc reporting functionality includes drill-downs, pivot tables, chart building, and detail reporting.

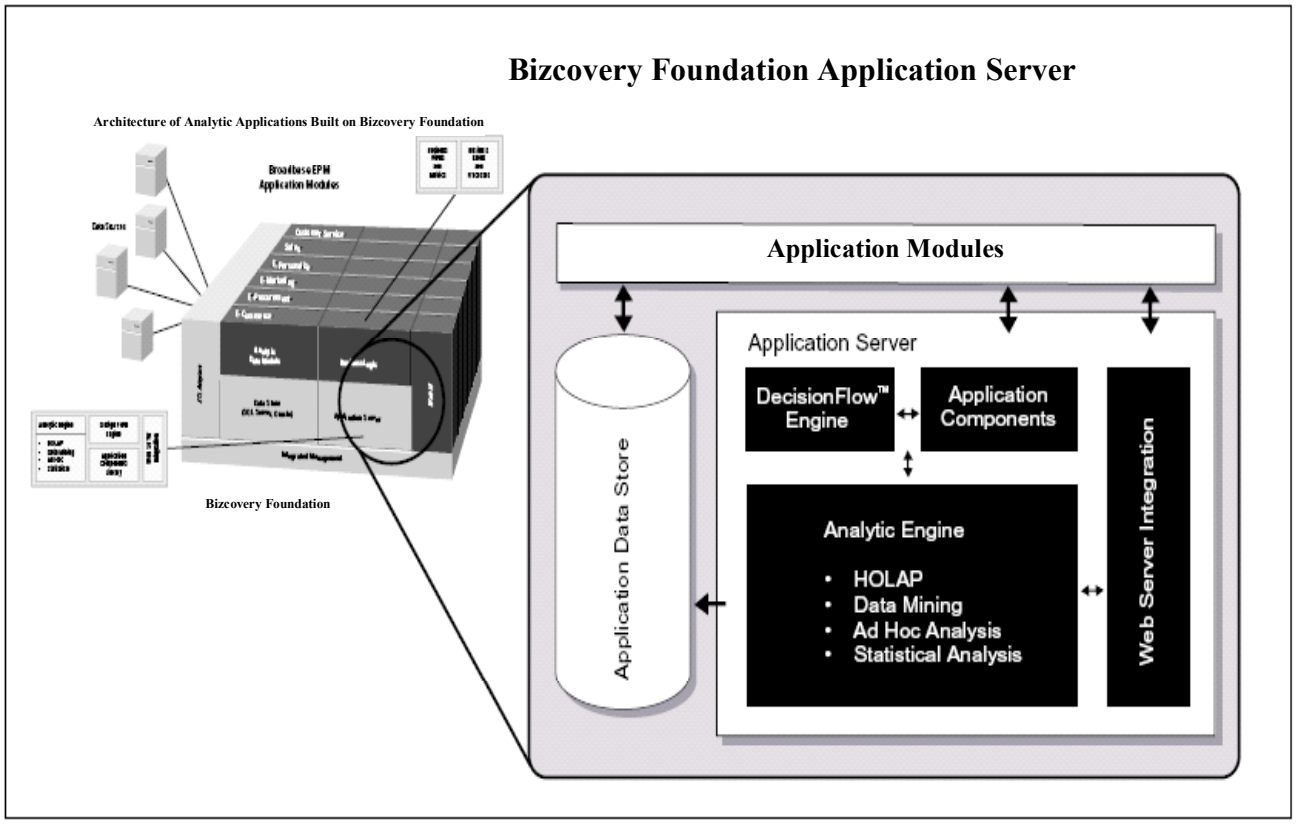
Publish & Subscribe Capability. Bizcovery application server supports publish and subscribe capabilities. Users may publish the analytical reports they create. They may also request published reports. Users can subscribe to a report and specify a schedule for reports to be "pushed" to their desktop.

These reports may be delivered on a regular basis via e-mail or printed copy based on a subscriber list. By viewing or selecting from a list of reports, business views or the columns in a business view, users may build their own queries, reports and analytics.

The analytic engine is one of the most important components of the Bizcovery system architecture and significantly enhances the power of the analytic applications built on Bizcovery' Foundation.

Decision Flow Engine. Bizcovery Foundation incorporates a Decision Flow Engine. Decision flow in analytic applications is the equivalent of workflow in operational or transactional systems. For example, workflow in operational systems may involve routing of forms such as supply order forms or authorizations request forms between back or front office systems such as Peoplesoft or Clarify.

However, decision flow involves routing the results (data set) from one report viewed by a user to the next report requested by the user. In this way decision flow is the analytic



equivalent of workflow.

Decision Flow Functions. The decision flow engine enables decision flow functions such as organizing analytic reports or functions, sharing information among views and reports and identifying or executing actions based on analysis. Each application can be readily enhanced through the use of the decision flow engine.

Supports Business Roles and Procedures. The decision flow engine supports business roles and procedures. Decision flow applies standard Bizcovery or customer defined business rules to user roles (e.g., marketing manager or business analyst) defined in the Bizcovery system. These rules are applied against user roles to support an organization's business practices, policies and procedures.

Decision flow is a powerful feature. This functionality significantly enhances application functionality by making the applications intuitive and easier to navigate. Decision flow adds intelligence to otherwise unintelligent and static reports.

Application Components Library. Bizcovery provides a library of application components that may be used to create an analytic application. For example, Bizcovery provides templates for building various types of data views (e.g., bar charts, pie charts, grids, tables, etc.).

Bizcovery's extensive application component library allows customers to reuse components to create new applications. This component library also helps Bizcovery's customers develop new applications quickly and helps its partners to leverage their industry know-how and shorten the time-to-market to develop packaged analytic applications.

Web Server Integration. Bizcovery utilizes third party web servers to accept actions or page requests from users and deliver results or pages to users. Bizcovery currently integrates with Microsoft's IIS web server. Bizcovery provides a superior web server integration architectural design that utilizes industry standard and industry leading web architecture components. Through Bizcovery web server integration powerful relational and multi-dimensional functionality is provided through a common web browser.

Integrated Graphical Application Management and Security

Integrated Graphical Application Management. Bizcovery Foundation provides an integrated management tool that is used to manage, design, modify and deploy the packaged analytic applications. Unlike many product suites that require several disconnected "tools" to manage the entire integration process, Bizcovery provides one single, graphical "drag and drop" environment to manage all tasks.

Bizcovery Foundation is a network-based client/server facility. All Bizcovery Foundation components run on Windows NT Based operating system (Windows 2000, Windows XP Professional, and Windows 2003). A Bizcovery Foundation administrator may connect their local machine to a Bizcovery Server anywhere on the network.

Bizcovery's integrated graphical application management environment saves administrators and developers time and aggravation associated with managing and manipulating multiple application management tools. The Bizcovery integrated management environment seamlessly combines graphical development, data management, and administration to yield a complete platform in which to modify, deploy, and maintain the Bizcovery analytic applications.

Bizcovery Security. Bizcovery supports several levels of security, including user level (individual users, groups and roles) and report level security.

User Level Security. Every user of the Bizcovery system is assigned a user ID and password. Bizcovery implements user level access to the applications through the use of "roles" (e.g., Business Analyst, Sales Representative, etc.), which provides security for the application where users have access to the application according to the role assigned. Roles and/or specific user IDs may be assigned to "groups" such as "marketing" or "sales".

Report Level Security. Groups of users, individual users or roles are granted access to reports. For example, sales reports may be available to the "Sales" user group and special executive officers on an exception basis.

Closed Loop Tiebacks. Success requires extending beyond analysis, averages, and estimates. Once analysis has been performed action must be taken. Without closed-loop integration business managers must navigate through many disparate e-business and operational systems to perform the action that the analysis revealed to be necessary. Bizcovery allows users to perform these business optimization actions. Customers may create tiebacks that translate these actions into closed-loop transactions in e-commerce and operational systems.

Businesses must be able to act quickly and easily to close the loop by translating information derived from customer activity into actions, business rules or online interactions. Examples of such intelligence-driven, closed-loop actions include:

- Optimizing and personalizing advertising and website content to enhance customer retention;
- Automatically identifying and offering cross-sell and up-sell opportunities to increase revenue per customer across sales channels;
- Delivering assisted buying and selling features, information and content to improve customer service;
- Proactively providing assisted or self-service customer support to reduce costs and increase post-sale customer satisfaction.

The Bizcovery integrated management environment makes creating closed loop tiebacks to operational systems easy. Bizcovery currently provides tools for customers to create tiebacks. These tools consist of Java classes in the Bizcovery integrated environment.

The closed-loop functionality simplifies end user tasks, improves customer service and increases revenue by supporting personalization.

Open Architecture

Open Metadata in XML. Bizcovery employs an open metadata approach and uses the Extensible Markup Language (XML) to store metadata. Use of XML to store metadata offers many important benefits:

- **Simplicity.** XML is uncomplicated, easy to extend and simplifies the Bizcovery and source system upgrade process.
- **Wide adoption.** Today's Web browsers have robust, built-in XML support. This browser support provides further impetus for industry standardization of metadata in XML.

Bizcovery is one of the first few analytic application platform vendors to implement and truly realize the benefits of XML. The use of XML establishes Bizcovery as a thought and market leader in metadata and analytic processes standards development.

Use of the Java Programming Language. Bizcovery utilizes the Java programming language for two primary purposes; building components for Bizcovery adapters and building business rules or automated

processes. Java transformation classes, used to build adapters, accept various parameters and return rows and columns from source databases. The Java classes used to build business rules and roles are "executed" on a data set to transform data, automate a process or enforce a rule in the Bizcovery analytic applications.

The Bizcovery solution contains hundreds of Java classes for all application modules. The following are two representative Java algorithms.

- **Queue Time.** The queue time algorithm computes the time a customer stays in queue from raw time stamp data. For example, operational systems such as Clarify record what time a customer talked to a customer support representative and then to a product-marketing manager. The Clarify system records what time the customer support and product marketing calls began and ended, however, they do not automatically calculate "length of time" spent in queue for each call.
  The Bizcovery queue time algorithm automatically calculates the length of time spent in queue and calculates customer support representative usage based on their specific workday schedule.

- **Time Zone.** The time zone algorithm automatically calculates what time zone a call came from based on the location of origin or other parameters that may be supplied from the operational system.

Bizcovery Java algorithms may be reused to create new applications or may be modified for use in international implementations or for customer specific needs. The vast library of Java algorithms is one of the key characteristics of the Bizcovery architecture that makes Bizcovery analytic applications intelligent and intuitive.

Bizcovery Analytics / Reporting Services

Web-based User Interface

The easy-to-learn and easy-to-use browser-based interface enables business users and decision makers throughout an organization to take full advantage of Bizcovery from their desktop with minimal training. Bizcovery's web-based interface guides business users through the e-business analysis process, while allowing advanced users access to a more robust interface and functionality.

Web Based. All Bizcovery analytic applications are delivered via an easy-to-use web-based user interface. The intuitive web-based applications guide the user through pre-defined analysis action steps. Through the web interface business users are isolated from the complexity of the underlying data structures and may begin immediately to perform "drill downs" and easily create new reports.

Zero Administration Client. The Bizcovery web user interface is a zero administration application. The Bizcovery web user interface may be fully installed on client machines with the click of a mouse and does not require any administrator visits to users' desktops.

Small Footprint Client. The Bizcovery web user interface automatically installs to a user's client machine. During the automatic installation process "plug-ins" that supports the Java and Active X components are automatically downloaded to the client browser and automatically installed. These are the only software components and files that are downloaded and require a negligible amount of hard-drive space.

Central Administration and Maintenance. Bizcovery system administrators can centrally install, manage and administer web users without ever having to visit the users' desktops. Central administration and maintenance saves time, money and headaches for IT managers and

administrators.

Easy Customization. If desired, users may customize the frames of the Bizcovery web user interface. Names, fonts, graphics and other user interface characteristics may be customized and then centrally deployed to users' desktops automatically.

E-Mail and Help Functionality. Bizcovery integrates with e-mail systems for alternative notification and collaboration.

BIZCOVERY DESIGN APPROACH

The Bizcovery design approach involves integration of three key features that surround and support the total solution. Bizcovery also supports a "design once, deploy anywhere" approach and an end-to-end solution. Bizcovery's system architecture is open, extensible and robust:

Open, Adaptive Architecture for Seamless Enterprise Integration. Bizcovery analytic applications platform is built for an adaptive and independent design that allows for seamless enterprise integration. Bizcovery runs on leading relational databases, such as Microsoft SQL Server and Oracle. Bizcovery Foundation is composed of industry standard SQL, Java and XML components, incorporates Microsoft Analysis Server, and a metadata repository built entirely in XML. Bizcovery Foundation operates on Windows platforms and access data storage on both Windows and UNIX platforms. Bizcovery allows for web-based or client/server based user interfaces with graphical "drag and drop" components.

Easily Add Data Sources, Develop or Extend Applications. Bizcovery is extensible to new analysis through an adaptive layer for robust data extraction, transformation and load, or ETL, capabilities, including column level or table-expression level Java functions. The adaptive ETL layer includes connections to key enterprise and e-business systems and customer data sources. Bizcovery Foundation incorporates Java classes to build business rules, transform data, automate processes or enforce rules in the Bizcovery analytic applications.

Scales with the Enterprise. Bizcovery enables distribution of analytic applications to additional users and locations, through support for distributed computing and heterogeneous environments. Bizcovery administrators may separate and deploy the total analytic application built on Bizcovery to separate servers in order to optimize system performance.

Design Once, Deploy Anywhere.

Bizcovery utilizes a "design once, deploy anywhere" approach that simplifies development, deployment and maintenance of the analytic application built on Bizcovery. This approach involves four stages: design/adapt, configure, deploy and upgrade. Each stage is described below.

Design/Adapt. Bizcovery allows architectural components be compartmentalized for reuse and ease of maintenance. Components of an application can be created such that they may be easily reused and combined to build or modify analytic applications. The design process is iterative and customers may deploy an analytic application and later change the logical design to accommodate new analysis.

Configure. The configuration stage of the "design once, deploy anywhere" approach involves adjusting customer site and system specific administrative settings. Bizcovery supports distributed computing by allowing individual applications or application components to be deployed to different servers or physical locations during the configuration stage (see "Open Data Store" section for details).

Deploy. Applications built on Bizcovery Foundation can be easily and quickly deployed. The Bizcovery integrated

management environment recognizes changes that are made to operational systems and alerts Bizcovery administrators. This feature helps to streamline the deployment process.

Upgrade. Bizcovery supports the upgrade process by allowing incremental upgrades. Production instances of Bizcovery may be modified and changed without disturbing the production instance in any way.

End-to-End Solution

Bizcovery's open technology and end-to-end approach ensure rapid deployment and easy ongoing maintenance. As a result, business managers may concentrate on business results, not technical integration. Bizcovery provides the platform required for complete analytic applications:

- **Acquisition.** Robust data extraction, transformation and load, including Java scripts, functions used at both the column level and the table-expression level, etc.
- **Analysis.** Comprehensive OLAP, data mining, statistical and ad hoc analysis. "Server-side" engine and an extensible analytic library ensure company-wide consistency and shared best practices.
- **Delivery.** Web-based reporting and publish and subscribe information delivery for enterprise deployments, with alerts and triggers for exception-based analysis.
- **Management.** Automated administration and scheduling. Unique graphical blueprinting for "drag-and-drop" application development and management.

Bizcovery's end-to-end analytic application platform architecture provides a complete and comprehensive platform solution that gives corporations strategic market advantages and improves their financial bottom line.

CONCLUSION

The Bizcovery architecture is unparalleled in its flexibility, openness and ease of implementation. Bizcovery products scale to meet the needs of any enterprise.

Modifications to application built on Bizcovery Foundation are dramatically easier to make than those built on any other platforms on the market today. Unlike many products, the Bizcovery solution can be deployed in the shortest time possible.

The Bizcovery solution allows for rapid deployment and integration of operational applications that give business users analytic power at the click of a mouse.

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