



Business Intelligence Solutions

Cognos BI 8

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Introduction

Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. By applying the power of BI tools, company's raw data enables company to analyze trends, to see how a particular product line is selling, to determine market share, to compare its performance to a competitor's, and to give the critical information needed to forecast and make informed decision in the business.

With millions of users worldwide, Cognos is the most well-known supplier in the business intelligence space and are perceived to be the market leader. The latest release, Cognos 8 BI, is a powerful suite of modules that share a common infrastructure for the creation, management and deployment of queries, reports, analyses, scorecards, dashboards, and alerts.

Cognos BI 8 Solutions

Cognos is the leading provider of enterprise business intelligence solutions that optimize the performance of the world's largest and most successful organizations. The end-to-end answer to enterprise requirements is why many of the world's leading organizations view Cognos business intelligence to be as mission-critical to their business as their computing, database, and Internet infrastructure.

Cognos BI 8 is adaptable to any data source, and operates from a single metadata layer. Cognos also supports multilingual reporting.

Cognos 8 Components

Cognos BI 8 consists of different components. Every component is integrated and in one place and each component uses one common metadata.

- **Cognos Connection** - it is a Web portal for Cognos 8 and a component which interacts with the Content Store. It is a frontend to publish, find, manage, organize, and view organization's business intelligence data.
- **Cognos Query Studio** - a tool to create basic ad-hoc reports and a lighter version of Report Studio. It allows users to create one 1-page report at a time. Application used by Query Authors and Report Authors.
- **Cognos Report Studio** - used to create and manage more advanced reports, which are very often standardized and recreated periodically and distributed to people in various departments in an organization. Reports designs created in Query Studio can be read and edited in Report Studio (not the opposite way). Report Studio is used by Report Authors.

- **Cognos Analysis Studio** - an application to analyze cubes and explore business data in a multidimensional manner. Mainly used by business analysts.
- **Cognos Metrics Studio** - used for the scorecarding. The idea behind it is to put performance indicators next to the organization's key performance measures (red, orange, green status notation).
- **Cognos Event Studio** - a process (an agent) which runs in the background and monitors the data and reacts when occurs something which may be cause a problem in the future in the business. For instance, if quantity of product X on stock is less than a given value, event manager can send an email to the responsible person which will contain a warning with problem description and a cognos report attached.
- **PowerPlay Transformer and PowerPlay Client** - the default Cognos 8 installation comes with the PowerPlay Transformer 7.3. By including PowerPlay in Cognos 8 suite, Cognos shows that they still have no complete replacement for this strategic product.
- **Content Store** is a database where the metadata for all the Cognos 8 component is stored and managed centrally. Content store can be accessed directly from the **Framework Manager**. Framework Manager is the Cognos 8 modeling tool for creating and managing business-related metadata for use in Cognos 8 analysis and reporting.
The main users of Framework manager are data warehouse developers and data modelers. Report authors base on the metadata information set up using Framework manager when creating new reports.

Cognos 8 Capabilities

Cognos 8 Business Intelligence is the only Business Intelligence product to deliver the complete range of BI capabilities: reporting, analysis, scorecarding, dashboards, business event management as well as data integration, on a single, proven architecture.

All BI capabilities are available from a single product, enabling users to work their way with information, using role based access to centrally managed data.

Product Capabilities:

- **Reporting**
A single, adaptive authoring environment for the full range of reports - business, production, dashboard, ad hoc.
- **Analysis**
Explore and analyze large volumes of data with fast and predictable response times - either OLAP or dimensionally aware.

- **Scorecarding**
Link initiatives to strategy with metrics and strategy maps to give at a glance performance against target.
- **Dashboards**
Deliver information from different sources in a single visual report.
- **Business Event Management**
Automate the detection and management of important business events.

Business Intelligence Systems

What Kind of Companies Uses BI Systems?

BI systems are becoming one of the essential tools for the success of companies in a wide range of industries.

Many government agencies use BI tools that help them maximize their efficiency in the often complex, time consuming, and expensive procurement process. In retail, Wal-Mart has been using BI systems to organize and use its enormous amounts of data which helped company to dominate the retail industry. Amazon and Yahoo aren't just e-commerce sites; they are extremely analytical and follow a "test and learn" approach to business changes. They all use BI systems, same as Capital One Bank, which runs more than 30,000 experiments a year to identify desirable customers and price credit card offers. Restaurant chains such as Hardee's, Wendy's, Ruby Tuesday and T.G.I. Friday's are heavy users of BI software. They use BI to make strategic decisions, such as what new products to add to their menus, which dishes to remove and which underperforming stores to close. Professional sports teams such as the Boston Red Sox, Oakland A's and New England Patriots have been using BI systems extensively for many years, both on and off the field, to select players and stay below the NFL salary cap.

Data Warehousing

Business intelligence as a discipline is made up of several related activities. BI can be approached roughly as being a Data Warehouse, with three layers on top of it:

1. Queries & Reports
2. OnLine Analytical Processing (OLAP)
3. Data Mining

The term Data Warehouse was coined by Bill Inmon in 1990, which he defined in the following way: "A warehouse is a subject-oriented, integrated, time-variant

and non-volatile collection of data in support of management's decision making process".

Data warehousing is combining data from multiple and usually varied sources into one comprehensive and easily manipulated database. Common accessing systems of data warehousing include queries, analysis and reporting. Because data warehousing creates one database in the end, the number of sources can be anything you want it to be, provided that the system can handle the volume, of course. The final result, however, is homogeneous data, which can be more easily manipulated.

Data warehousing is commonly used by companies to analyze trends over time. In other words, companies may very well use data warehousing to view day-to-day operations, but its primary function is facilitating strategic planning resulting from long-term data overviews. From such overviews, business models, forecasts, and other reports and projections can be made. Routinely, because the data stored in data warehouses is intended to provide more overview-like reporting, the data is read-only. If you want to update the data stored via data warehousing, you'll need to build a new query when you're done.

This is not to say that data warehousing involves data that is never updated. On the contrary, the data stored in data warehouses is updated all the time. It's the reporting and the analysis that take more of a long-term view.

Data warehousing is not the be-all and end-all for storing all of a company's data. Rather, data warehousing is used to house the necessary data for specific analysis. More comprehensive data storage requires different capacities that are more static and less easily manipulated than those used for data warehousing.

Data warehousing is typically used by larger companies analyzing larger sets of data for enterprise purposes. Smaller companies wishing to analyze just one subject, for example, usually access data marts, which are much more specific and targeted in their storage and reporting. Data warehousing often includes smaller amounts of data grouped into data marts. In this way, a larger company might have at its disposal both data warehousing and data marts, allowing users to choose the source and functionality depending on current needs.

1. Queries and Reports

Comparatively little is written on querying and reporting (Q&R). That is, compared to techniques like OLAP and data mining. This is probably due to the fact that queries and reports are the most basic forms of analysis on a data warehouse. They already existed back in the 1970's, in the form of hardcopy reports. Today users have available highly-interactive, online, analytic processing and visualization tools, where selected data can be formatted, graphed, drilled,

sliced, diced, mined, annotated, enhanced, exported and distributed. Queries and reports fulfil the purpose of telling management and users “what has happened”, for example how high the sales were in the past month or how are the sales of this month compared to those of last month.

Nearly everywhere querying and reporting are lumped together in one tool, which is capable of producing two types of reports.

- The first is the standard reporting. Examples of these are point-in-time reports on sales figures or other key business that appear each day, week, month, etc.
- The second type of reporting is when a report is the output of an ad hoc query. Using a query tool, a user can ask questions about patterns or details in the data. Logically, the answer will be in some form of a report. Even though this type of reporting can also be standardized when necessary, the unique thing about queries is that they are built so that the user can ask extra questions about information that doesn't appear directly from the data. If you take this querying to a higher-dimensional level and shorter response times, you arrive at OLAP-tools.

The results in the reports form an important input element for the Customer Relationship Management. For instance, reports on sales and marketing analyses may result in readjusting the marketing strategies or promotions. Financial reports may indicate that the company is running risks in certain product areas. Analyzing customer profitability can lead to changes in the way certain customers are approached when buying their products. And there are many more examples where these came from.

2. OLAP

On Line Analytical Processing (OLAP) is an approach of producing reports from computer systems for analytical purposes; that means, most of the queries used in OLAP are analytical queries. On Line Analytical Processing queries are multidimensional in nature. OLAP is actually a part of a wider spectrum called Business Intelligence, which consists of many other areas in addition to OLAP. In today's business systems, OLAP helps management in quick and appropriate decision making. The analytical reports generated using OLAP may have different dimensions, like time, quantity, location, category and so on so forth. The term OLAP is a modified form of term OLTP which stands for On-Line Transaction Processing. OLTP are the systems which work directly into business transactions and are real-time in nature most of the time.

OLAP analytical queries are up to ten times faster than queries with the same results if run on OLTP; this fast performance comes with cubes. At the heart of OLAP, are data cubes which are populated with aggregations. Aggregations differ from system to system depending upon the dimension we are using in our

OLAP system.

OLAP systems have three basic sub categories as follows:

- MOLAP (Multidimensional OLAP): the classical form of OLAP where all of the data is transformed into dimensional data. Dimensions include but are not limited to time period, location, product code etc.
- ROLAP (Relational OLAP): Relational OLAP system uses existing relational database as its core data and then dimensional tables are created as and when required.
- HOLAP (Hybrid OLAP): it is the combination of the two above.

3. Data Mining

Data mining uses a relatively large amount of computing power operating on a large set of data to determine regularities and connections between data points. Algorithms that employ techniques from statistics, machine learning and pattern recognition are used to search large databases automatically. Data mining is also known as Knowledge-Discovery in Databases (KDD).

Like the term artificial intelligence, data mining is an umbrella term that can be applied to a number of varying activities. In the corporate world, data mining is used most frequently to determine the direction of trends and predict the future. It is employed to build models and decision support systems that give people information they can use.

Decision trees are used to filter mountains of data. In a decision tree, all data passes through an entrance node, where it faces a filter that separates the data into streams depending on its characteristics. For example, data about consumer behavior is likely to be filtered based on demographic factors. Data mining is not primarily about fancy graphs and visualization techniques, but it does employ them to show what it has found. It is known that we can absorb more statistical information visually than verbally and this format for presentation can be very persuasive and powerful if used in the right context.

As our civilization becomes increasingly data-saturated we will unconsciously discover things that might be missed on the first pass over. Data mining will let us correct these mistakes and discover new insights based on past data, giving us more bang for our data storage buck.

Conclusion

Today Cognos has over 23,000 customers worldwide. Its been used by different industries among which are libraries, since Cognos is high-rated with regard to ease of use, customization, and export formats. It supports Windows, UNIX, and

Linux operating systems and is adaptable to any data source. Cognos is characterized by one drag-and-drop authoring environment for creating all report types, including dashboards. Cognos BI 8 export different formats including: CSV, Excel, HTML, PDF, and XML.

Finally, Cognos is probably more expensive than the other BI tools, typically around \$4,000 or more for a full single-user license, but in the same time Cognos BI 8 provides a complete and scalable BI solution for corporate business information management and reporting and it comes with more training available than any other similar product.