

BI solutions for modern management of organizations - Cognos

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Business Intelligence has evolved in the last decade increasingly relying on real-time data. Business analysis has become essential. This involves actions in response to results analysis and instant change of business processes parameters making BI beneficial for several reasons.

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1 Introduction

Business Intelligence (BI) has two different basic meanings related to use of the term *intelligence* [1]. The first meaning, less frequent, is referring to the capacity of human intelligence in business or in activities. Business Intelligence is a new and powerful area of investigation of the applicability of human cognitive abilities and artificial intelligence technologies in management and decision support in various business issues. The second meaning displayed in Fig.1 refers to intelligence as information valued for its use and relevance.

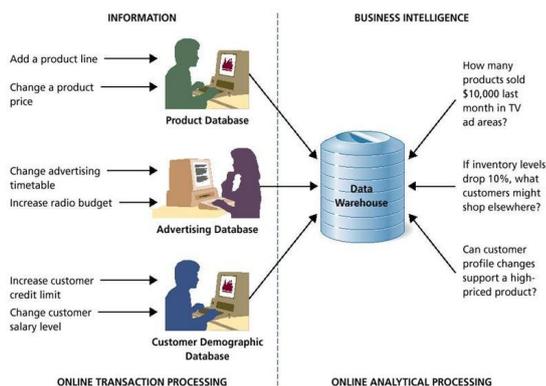


Fig.1 Information and business intelligence [2]

Application. BI applications include decision support systems, query and reporting tools, online analytical processing and also forecasting and data mining systems. Ultimately, the final results of BI implementations are depth analysis, refining and concentrating a

large number of business information in concrete performance indicators and finally the organizational knowledge. BI implementations are efforts involving multiple issues, from organizational strategy to organizational processes and management, from application management to information infrastructure changes. BI projects do not aim to teach managers how to make the right decisions; instead they help them make decisions based on facts and figures, not on assumptions. Companies collect vast amounts of data through transactional systems (e.g. ERP, CRM, and SCM) that have implemented over the years and which they use daily to perform a variety of corporate functions. Before the notion of BI was launched, there was no concept that allowed the use of large amounts of data by integrating and transforming them into information [3]. Development of BI concepts and technologies creates a management environment where current and new data can be used to improve the quality in the process of decision making. In addition, the existence of large volumes of transactional data, especially transactional data with a high degree of specificity and particularity, creates opportunities for management to improve forecast accuracy.

BI Tools:

- Spreadsheets
- Query software and OLAP (Online analytical processing)

- Digital Dashboards (an executive information system user interface is designed to be easy to read)
- Data mining (process of extracting patterns from large volumes of data by combining methods from statistics and artificial intelligence with those of the database management)
- Decision Engineering (framework that unifies a number of best practices for organizing decision making)
- Process mining (extracting knowledge from the events recorded by the information system) [3]
- Business performance management is a set of management and analytic processes that enable management of an organization's performance in order to achieve one or more goals.



Fig.2 Product capabilities [4]

Traditional BI capabilities are extended beyond reporting, analysis and creating dashboards and scorecards, which are represented in figure 2. Those who use BI can also plan and conduct scenario modelling, real-time monitoring and predictive analytics. Managers want to be able to perform their own analyzes and view data in real time [6]. They want to connect predictive analytics and social media analysis with traditional BI reports and dashboards to get a complete view of the business, customers, competitors and market.

Applications for social media make it possible to analyze the attitude of customers, products and associated brands and emerging issues on the organization or market segment.

IBM Cognos Business Intelligence provides reports, analysis, dashboards and scoreboards to help support the way people think and work when they are trying to understand business performance. You can freely explore information, analyze key facts and quickly collaborate to align decisions with key stakeholders [5].

- **Reports** equip users with the data they necessitate to make fact-grounded conclusions [4].
- **Dashboards** avail users access, interact and personalize content in a way that assists on how they make decisions help users access, interact and personalize content in a way that supports how they make decisions.
- **Analysis capabilities** provide access to data from multiple angles and perspectives so you can watch and study it to make informed decisions [4].
- **Collaboration** capabilities include communication tools and social networking to fuel the exchange of thoughts during the decision-making process.
- **Scorecarding** capabilities automate the capture, management and monitoring of business metrics so you can compare them with your strategic and operational targets [5].

2. IBM Cognos Business Intelligence

Cognos Incorporated was an Ottawa, Ontario-based company making business intelligence and performance management software. “Founded in 1969, at its peak Cognos employed almost 3,500 people and served more than 23,000 customers in over 135 countries until being acquired by IBM on January 31, 2008. While no longer an independent company, the Cognos name continues to be applied to IBM's line of business intelligence and performance management products” [11].

IBM Cognos Business Intelligence is an integrated business intelligence suite that offers a broad range of functionality to help understanding an organization's information. Everyone in the system can use IBM Cognos 8 to view or create business reports, examine information,

and monitor outcomes and metrics so that they can prepare efficient business decisions [8].

IBM Cognos 8 integrates the following business intelligence activities, shown in table 1, in one Web-based solution.

Table 1 Components and activities [8]

| | |
|-------------------------------------|--|
| IBM Cognos Connection | Publishing, managing, and viewing content |
| IBM Cognos Insight | Managed workspaces |
| IBM Cognos Workspace | Interactive workspaces |
| IBM Cognos Workspace Advanced | Ad hoc querying and data exploration |
| IBM Cognos Report Studio | Managed reporting |
| IBM Cognos Event Studio | Event management and alerting |
| IBM Cognos Metric Studio | Scorecarding and metrics |
| IBM Cognos for Microsoft(tm) Office | Works with IBM Cognos BI content in Microsoft Office |
| IBM Cognos Query Studio | Ad-hoc querying |
| IBM Cognos Analysis Studio | Data exploration |

“**IBM Cognos Connection** is the Web portal for IBM Cognos Business Intelligence.” It is the beginning spot to access BI information and the functionality of IBM Cognos BI. The Web portal can be used to publish, find, manage, organize, and view organization's business intelligence content, such as reports, scorecards, and agents. Possessing the necessary permissions, various studios can be accessed from the portal and this can be used for content administration, including programming and distributing reports, and creating businesses. In **IBM Cognos Insight**, the user can analyze information, explore scenarios, and influence decisions by creating personal or managed workspaces. The interactive workspaces can be used to pass the results to managers. Because Cognos Insight supports write-back, the user can also use these workspaces to collect and consolidate management targets, commitments, and forecasts. “IBM Cognos Insight is provided with IBM Cognos BI. IBM Cognos Connection Installer for Cognos Insight can be used in order to install provisioning software

on Cognos BI servers. This software allows multiple users to download and install IBM Cognos Insight on their computers from the Cognos Connection interface.”

In **IBM Cognos Workspace**, the user can create sophisticated interactive workspaces using IBM Cognos content, as well as external information sources such as TM1 Websheets and CubeViews, according to specific information needs. The user can view and open favourite workspaces and reports, manage the content in the workspaces, and e-mail the workspaces. Also, can be used comments, activities and social software like IBM Connections for collaborative decision making.

With **IBM Cognos Workspace Advanced**, the user can perform advanced data exploration and create simple reports. When the user is in a workspace in IBM Cognos Workspace and wants to perform deeper analysis and report authoring, he can seamlessly graduate to Cognos Workspace Advanced, where he can perform more advanced data exploration, such as adding additional measures, conditional formatting, and advanced computations [7]. The user can also launch Cognos Workspace Advanced from the IBM Cognos Connection portal. With Cognos Workspace Advanced, the user can create reports with

relational or dimensional data sources, and that shows the data in lists, crosstabs, and charts. He can also use his external data source. With this feature, a report authored in IBM Cognos Report Studio can be accessed; the objects that can be inserted only in Report Studio can be seen (such as map). However, he cannot modify these objects.

Using **Report Studio**, report authors create, edit, and distribute a wide series of professional reports. They can also define corporation standard report templates for use in Query Studio, and edit/modify reports created in Query Studio or in Analysis Studio.

Report Studio can be used for reports which are intended for a large audience, exist long enough to require maintenance for updating requirements and data or require a thorough check on the appearance. Report Studio provides powerful features, such as transferring in burst, prompts, maps and create advanced graphics and offers many ways to customize reports.

Event Studio is an action oriented agent which notifies the users when an business event occurs. Agents can publish details to the portal can deliver alerts by e-mail, can run and distribute reports based on events and can monitor the status of events.

In **Metric Studio**, the user can create and deliver a customized scorecarding environment for monitoring and analyzing metrics throughout organization. Users can monitor, analyze, and report on time-critical information by using scorecards based on cross-functional metrics.

In **IBM Cognos for Microsoft Office**, the user can work with secure IBM Cognos Business Intelligence content in his familiar Microsoft Office environment. He can extract report content from a variety of IBM Cognos applications, including IBM Cognos BI and IBM Cognos PowerPlay. IBM Cognos for Microsoft Office provides

access to all IBM Cognos report content, including data, metadata, headers, footers, and charts. The user can use predefined reports, or create new content using IBM Cognos Query Studio, IBM Cognos Analysis Studio, or IBM Cognos Report Studio. By importing content into Microsoft Excel spreadsheet software, the user can work with the data and leverage Microsoft Excel's formatting, calculation, and presentation capabilities. The user can also use the formatting and charting features of Microsoft Excel. By importing content into Microsoft PowerPoint and Microsoft Word, various reports and charts can be included to enhance the presentations and documents.

Using **Query Studio**, users with little or no training can quickly design, create and save reports to meet reporting needs not covered by the standard, professional reports created in Report Studio [8].

In **Analysis Studio**, users can explore, analyze, and compare dimensional data. Analysis Studio provides access to dimensional, OLAP (online analytical processing), and dimensionally modelled relational data sources. Analyses created in Analysis Studio can be opened in Report Studio and used to build professional reports [12].

IBM Cognos Transformer is a multi-dimensional data modelling component designed for use with IBM Cognos Business Intelligence. This component is useful to create a multi-dimensional model: a business presentation of the information in one or more different data sources that share common data [8]. After the user add the needed metadata from IBM Cognos Business Intelligence packages, reports, and other various data sources, model the dimensions, customize the measures, and apply IBM Cognos BI secured views with dimensional filtering, he can create IBM Cognos PowerCubes based on this model. These cubes can be deployed in order to support OLAP reporting and analysis around the globe.

IBM Cognos Business Intelligence Administrators ensure that IBM Cognos BI

runs without interruption and at optimal performance. They can:

- Define connections to data sources of the organization
- Define security permissions for users and groups in the organization
- Specify distribution lists, contacts and printers
- Manage servers and dispatchers, and can finely adjust performance for IBM Cognos BI
- Predefine links to an entire package that authors can easily add it to their reports
- Customize the appearance and functionality of IBM Cognos BI

IBM Cognos BI is secured by setting permissions and by enabling user authentication. When anonymous access is enabled, IBM Cognos BI can be used as a specific user without authentication. In IBM Cognos BI, administrators define permissions so that users can access functions. For example, to edit a report using IBM Cognos Report Studio, security permissions and the appropriate license are required. In addition, each entry in IBM Cognos Connection is secured by defining those who can read it, edit and run [8].

IBM Cognos BI comes with the following capabilities:

1. Reports

- Cognos Business Intelligence features professional report generation capabilities that are easy to use and help minimize the effort to build them.
- Users can create their own reports (queries) or edit existing reports.
- Collaborative reporting features built into Cognos Business Intelligence helps users to communicate between them to make decisions and to gain additional insights.
- Users can access reports on mobile devices and can already interact with the report while

downloading - can view the downloaded pages and interact with them without the need to wait for complete download of the report.

2. Dashboards

- With the ability to create dashboards, Cognos Business Intelligence allows users to create and customize their ways of viewing dashboards that they can shape the needs.
- Historical data with variable data and what-happens-if scenarios provides extended insight of performance.
- Portable dashboards can be created that can support decisions on when and where to create

3. Analysis

- With analysis capabilities of Cognos Business Intelligence, users can use analytical reporting, trend analysis, statistical analysis and some other intuitive tools that can easily analyze information.
- Financial and business analysis can estimate the short-term business through advanced analytics and predictive statements what-happens-if.
- Support for operational and strategic decision cycles may engage the right people at the right time for analysis.
- Cognos Business Intelligence comes with options for mobile devices, analysis and offline interactivity along with versions for Microsoft Office to the appropriate user needs.

4. Collaboration

- The ability to form communities, to capture annotations, views and share opinions help streamline and improve decision-making groups.
- Workflow and ability to handle tasks are designed to connect users and to enhance activities coordination.
- Using IBM Connections and its social capabilities, users can share their opinions and request ideas.

5. Scorecarding

- Using measurement capabilities inside (scorecarding) of Cognos Business Intelligence, organization can compare

performance indicators with strategic goals.

- Facilities available that can analyze the organizational strategy can help departments and employees set their priorities.
- Model based on web interface increase management efficiency and encourages adoption by users.

3. Example – Performance Monitoring

With IBM Cognos Metric Studio, you can track the performance of an organization compared with its objectives. In a quick glance, decision-makers at every level of the organization can see the status of the organization and then react or make a plan. A metric is a key indicator of measures that compare actual results with the results of the target. An index of measurement registers also who is responsible for the outcome and impact index [8]. A scorecard is a collection of performance metrics and projects that reflect the strategic goals of a department in an organization. The following example shows how you can:

- examine a strategy map for a visual representation of the strategy and objectives of this strategy for an organization
- examine and understand the performance of a metric on a scorecard
- create an action on an index measuring
- add a metric to watch list

Suppose that we are a sales manager for a region in Sample Outdoors Company. Regularly consult a scorecard that contains metrics for the company's sales. Measurement indices provides us a quick comparison between actual sales and the company's objectives it. The amount returned is one of the indices of measurement. To perform this exercise, you need to have licensing and security permissions appropriate for this functionality.

Things to note:

- Measurement indices appear as **weak** (red), **medium** (yellow) or **excellent** (green).
- For each metric, we can see if the situation improves, stays the same or gets worse.
- When we position the pointer over the title of a metric, we can see a chart with historical performance metric. It extends a floating menu when you pause the cursor over a metric or above diagram.

Procedure

1. Opening IBM Cognos Connection from the web browser and access the URL obtained from the administrator. URL is like this: http://nume_server/cognos
2. On the **Welcome to IBM Cognos**, choose **Manage my measurement indices**.
3. Choose **Samples, Models, GO Metrics**.
4. Viewing a map of strategies: On the left pane, choose **Scorecards** tab and then **GO Consolidated**. In the right pane, select **Diagrams**. In **GO Strategy map** (figure 3), we see how we can quickly assess the performance of each purpose of the organization. Major indicators show the status of a specific strategy. Smaller indicators that appear in strategy show trend. Measured values of indices that do not register a good performance will appear in red. Indicators of status and trends, which appear in red, indicate possible problem areas. For example, in **Production and Distribution** function of strategy map, in **Control product quality** measuring index, **Return quantity %** is red, representing a measure of poor performance.

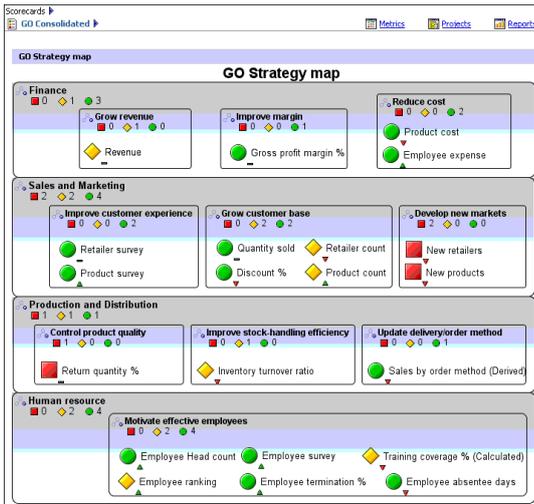


Fig.3 GO Strategy map

5. Exploring scorecard: In the left pane, click **Scorecards** and expand **GO Consolidated**. Note that Sample Outdoors Company has scorecards for each of the four functions of the company: Finance, Sales and Marketing, Production and Distribution and Human Resource. Expand **Production and distribution**, choose **Asia Pacific** and then choose **Metrics** tab showing all indices of measurement associated with the Asia Pacific region. Note that **Returns by reason index in Asia Pacific % wrong product ordered** is in red. To understand the cause of the problem, we further explore this metric: press **Asia Pacific - Amount refunded %**, then the **Diagrams** tab (figure 4). Expand measurement index in chart by clicking on the arrow next to the metric **Asia Pacific Returns by reason in % Orders failed**. We can see what data can be found in the index measuring **Quantity returned %**. We can also see which of the return reasons is a major problem.

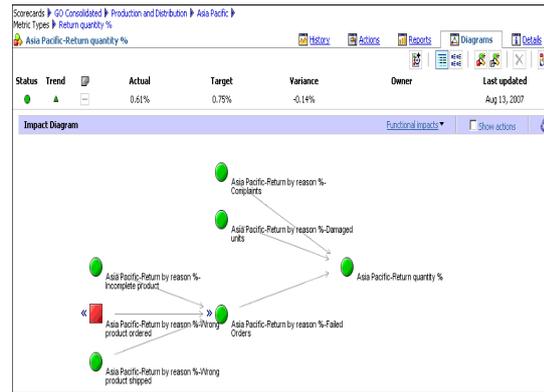


Fig.4 Diagram tab

To get more information on this metric, pause the cursor over **Asia Pacific - Quantity returned %**. (figure 5)



Fig.5 Metric tooltip

In the left pane, under **production and distribution**, press **Asia Pacific** and then on **Metrics** tab (figure 6) to view the metric related to the amount refunded. Note that the metric condition **Asia Pacific - Return by reason % wrong product ordered** is poor.

| Name | Actual | Target | Variance | Variance % | Benchmark | Time Period |
|---|--------|--------|----------|------------|-----------|-------------|
| Asia Pacific-Return quantity % | 0.61% | 0.75% | -0.14% | 18.80% | | Jul 2007 |
| Asia Pacific-Return by reason %-Complaints | 0.13% | 0.15% | -0.02% | 14.00% | | Jul 2007 |
| Asia Pacific-Return by reason %-Damaged units | 0.03% | 0.15% | -0.12% | 77.33% | | Jul 2007 |
| Asia Pacific-Return by reason %-Failed Orders | 0.44% | 0.45% | -0.00% | 1.11% | | Jul 2007 |
| Asia Pacific-Return by reason %-Incomplete product | 0.13% | 0.15% | -0.02% | 14.00% | | Jul 2007 |
| Asia Pacific-Return by reason %-Wrong product ordered | 0.17% | 0.15% | 0.02% | 13.33% | | Jul 2007 |
| Asia Pacific-Return by reason %-Wrong product shipped | 0.14% | 0.15% | -0.00% | 3.33% | | Jul 2007 |
| Asia Pacific-Inventory turnover ratio | 6.56 | 6.00 | 0.56 | 9.41% | | Jul 2007 |

Fig.6 Metric tab

6. We click on the metric **Asia Pacific - Return by reason % - Wrong product ordered**. In Metric Studio, tabs represent

questions that we might put, as we try to solve a problem or understand the information.

7. In the right pane, the **History** tab (figure 7), we click on the list. The information in the History tab, answer the question "When?". We see the actual values on the target metric data for previous periods. Also see half-yearly and annual summaries.

| Year | Quarter | Month | Actual | Target | Tolerance |
|---------------------|---------|-------|--------|--------|-----------|
| Average | | | 0.17% | 0.15% | 0.02% |
| 2007 | Q1 | Jan | 0.01% | 0.15% | 0.00% |
| | | Feb | 0.01% | 0.15% | 0.00% |
| | | Mar | 0.16% | 0.15% | 0.00% |
| Q1 Average | | | 0.06% | 0.15% | 0.00% |
| 2007 | Q2 | Apr | 0.08% | 0.15% | 0.00% |
| | | May | 0.05% | 0.15% | 0.00% |
| | | Jun | 0.02% | 0.15% | 0.00% |
| Q2 Average | | | 0.05% | 0.15% | 0.00% |
| 2007 | Q3 | Jul | 0.17% | 0.15% | 0.00% |
| | | Aug | | | |
| | | Sep | | | |
| Q3 Average | | | 0.17% | 0.15% | 0.00% |
| 2007 | Q4 | Oct | | | |
| | | Nov | | | |
| | | Dec | | | |
| Q4 Average | | | | | |
| 2007 Annual Average | | | 0.09% | 0.15% | 0.00% |

Fig.7 History tab

8. We click on the **Diagrams** tab. Diagrams tab information helps us understand the question "How?" by comparing our indices measuring other metrics. Impact diagrams show the relationship between the metric **Return by reason %** and other indices.

9. Create action for one of our business analysts, in which he investigates the performance of products returns: click the **Actions** tab. Choose new action. **Tip:** You must select a metric to see new action icon. In the **Name** box, type Kazumi Uragome the person who will own action. To announce the Kazumi what to do, in the **Description** box, type Please investigate. Near **Planned End** box, we click the Calendar icon and select a date a week away from today. **Hint:** You may need to scroll down to see **Planned End** box, and then we click on OK.

10. Add index measurement **Asia Pacific - Returns by reason % - wrong product ordered** on our list of supervisors to monitor it in the future easily in the following way: in the left panel, the scorecard **Production and**

distribution, we click on **Asia Pacific** and then tab **Metrics**; we click the measuring index **Asia Pacific - Returns by Reason % - wrong product ordered** and on the superior toolbar choose **Add the watch list** (figure 8), and press **OK**. In the left panel, we click on **My Folders** on the **Watch List**. Index **Asia Pacific - Returns by Reason % - wrong product ordered** appears on our list of supervisors

| Name | Actual | Target | Variance | Variance % |
|---|--------|--------|----------|------------|
| Asia Pacific-Return by reason %-Wrong product ordered | 0.17% | 0.15% | 0.02% | 13.33% |

Fig.8 Watch list

4. OBIEE vs. COGNOS

In Business Intelligence Tools 2014 survey was intended to compare various Business Intelligence tools, a comparison that ignores the supplier. Comparison of Obie vs. fourteen other tools Cognos Business Intelligence in more than 100 selection criteria. The criteria we are talking here are essential for obtaining success with Business Intelligence [9]. For example: OBIEE support or Cognos-based reporting roles and reporting components can be reused in the implementation of business intelligence, whether they are used in web reports, dashboards, analysis, intranet or mobile version?

The survey results revealed that Obie and Cognos have scored almost equal if all criteria are taken into account. But in different categories, each one has different score, and also the costs each are different [9].

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