

CHAPTER 11: BUSINESS INTELLIGENCE - SUPPLEMENTAL MATERIAL

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From the book [*The Next Wave of Technologies: Opportunities in Chaos*](#) by Phil Simon

A Very Brief History of BI

In his article “A Democratic Revolution in Business Intelligence?”, John Berry writes that “the emergence of distributed computing in the 1980s and 1990s dramatically changed the reporting environment. IT and business analysts were no longer the all powerful gatekeepers to important performance data. The emergence of BI tools meant managers could tap into data directly and even construct customized report criteria, albeit using complex functions in which a learning investment was required. Reports, however, still offered an incomplete and simplistic picture of what was happening in the organization, which meant that optimal decisions were not always reached.”

Many organizations early to adopt BI tools struggled to achieve meaningful results. Some merely attempted to use BI tools to replicate reports strewn together from legacy systems. Others threw expensive BI tools at inconsistent data housed in multiple repositories. For every organization that unearthed interesting trends in their data, many others relied upon limited tools such as spreadsheets to make critical business decisions.

A Simple BI Example

Let’s look at a simple example of how organizations can use BI tools. Consider Springsteen Energy, a fictitious company that sells eco-friendly products.¹ Springsteen management typically receives monthly reports that break down different sales figures. One such report is named “MTD Sales by Region.”

¹ Yes, I am a big fan of “The Boss.”

The report is presented as a crosstab showing a simple count of sales by US region (East, West, and Central) as rows, days of the month as columns.

Table 15.1: MTD Sales by Region at Springsteen Energy

	8/1	8/2	8/3	8/4	8/5
East	23	20	15	30	28
Central	5	3	7	2	10
West	15	55	22	10	19
All Locations	43	78	44	42	57

This report may be helpful for the director of sales, but it is inherently limited. The report clearly manifests an anomaly in the West on August 2nd. If no other report is available, the end-user has several options sans BI:

- find someone who can query the sales system for that information to tie out the number
- get on the phone with your friendly (or not so friendly) IT support asking the same question,
- contact the sales manager responsible for that region for an answer

Neither option is very Enterprise 2.0-friendly; each one involves old processes of requesting information from those who may or may not have it.

Enter BI. It allows end-users to “drill-down” on that information and to see the next level of detail. This typically involves simply double-clicking on that very number, as shown below.

Table 15.2: MTD Sales by State at Springsteen Energy

	8/1	8/2	8/3	8/4	8/5
CA	10	6	12	3	7
WA	5	9	7	2	8
OR	0	40	3	5	4
West	15	55	22	10	19

As Table 15.2 illustrates, Oregon saw an unusual spike in activity on the 2nd, preceded by a day of zero sales. Immediately, new questions spring to mind about the potential cause of this issue. They include:

- a break in the supply chain
- issues with the local office
- a problem in the tracking of the information

The next intuitive step would be to check the products involved in this sale. This is where “slicing-and-dicing” comes into play. By slicing and dicing, another

dimension such as Products can hone in on the specific cause of this spike in sales. This dimension can be included in the current view of the data. Filtering on Oregon and swapping in the Product dimension results in the following:

Table 15.3: MTD Sales by Product at Springsteen Energy

	8/1	8/2	8/3	8/4	8/5
Windmills	0	1	2	1	1
Solar Panels	0	35	0	3	0
Geothermal Heat Pumps	0	4	1	1	3
All Products	0	40	3	5	4

As Table 15.3 illustrates, the cause of the anomaly has become clear: there was a spike in the sales of Solar Panels on August 2nd.

By simply drilling down and slicing and dicing, the end-user has access to much more focused information while concurrently retaining the context of the previous report. Rather than calling the head of all sales in the West, the end-user can make more informed decisions—e.g., increasing inventory near that office or potentially expanding the marketing budget in that region. From a senior manager’s perspective, this is clearly better than simply knowing there was a “spike in sales in the West.”

Why is this BI?

At this point, the reader may be asking, “Can’t I simply have three reports that contain different levels of detail?”

The short answer is “yes.” However, what happens when end-users want see other data “sliced” into the report? Consider the following:

- What about Product Type (premium, mid-range, or low-End) ?
- What if end-users want to drill down further on the Sales region and see sales people in the Oregon office?

Without BI, these questions can only be answered by looking at more reports with more detail. This is more time-consuming and increases the chance for manual error.

Let’s look at the fundamental components of BI. In the crosstab, the rows and columns represent the report’s dimensions. These are simply attributes of the data. The most common dimension of all data is typically Time. While our example simply displayed data at the daily level, end-users could also drill down

to see hours within the day. Conversely, you could “drill-up” to see month over month or year over year trends.²

Looking the Sales Region dimension, drill from the top of the dimension (Region) down to state, and while not displayed, even further to sales person.

Table 15.4: Dimension View

Time	Region	Product	Product Type
Year	Region	Product	Product Type
Month	State/Office	Product SKU	
Day	Salesperson		

Dimensions by themselves don’t tell much of a story. End-users need to rely upon facts—also called measures. Your fact information in the above example is sales count. The power of OLAP grows when you can analyze many relevant dimensions and measures. With the above example, there is a big difference if the item sold was a stick of bubble gum vs. a solar panel—i.e., price, cost, and profit margin. The available dimensions and facts are predefined in a multidimensional cube of data. These dimensions can take one of three formats:

- logically stored in a database (relational OLAP or ROLAP for short)
- prebuilt into a highly indexed/compressed file
- a hybrid of both (hybrid OLAP or HOLAP for short)

Once facts and dimensions are understood, they can be applied to any set of data. From the Sales cube, BI tools could link or connect to many different types of related information that share similar dimensions. Returning to our previous example, clicking on Oregon could take the end-users to one of the following related cubes:

- an HR cube showing the average tenure of employees in that office
- a client-related cube showing a breakdown of top clients in the region
- a supply chain cube showing the order status and delivery schedule.

Against existing cube “views”, one could create thresholds and conditional formatting to make anomalies stand out. A conditional format could be set as a percentage, amount, quantity, or other metric to highlight statistical oddities. Applied above, rather than search to find the 55 quantity that stands out for the West, the BI tool highlights important values, calling attention to them for further action.

² Note that the data would have to allow for this. Again, BI does not magically convert data from “day” to “hour” unless “hour” is tracked in the database.

Table 15.5: Conditional Highlighting

	8/1	8/2	8/3	8/4	8/5
Windmills	0	1	2	1	1
Solar Panels	0	35	0	3	0
Geothermal heat pumps	0	4	1	1	3
All Products	0	40	3	5	4

The BI Vendor Landscape

Over the last several years, the BI vendor landscape has changed significantly. BI is not alone in that smaller upstarts have been trying to revolutionize the industry with the aforementioned niches, such as Mobile BI, In-Memory OLAP, and the like. There are no signs of that stopping. As a result of several large acquisitions, a few enormous firms with BI divisions have gobbled up several large independent BI firms. The largest of these acquisitions are presented in Table 15.11:

Table 15.6: Major BI Acquisitions

BI Company	New Parent
Business Objects	SAP
Cognos	IBM
Hyperion	Oracle