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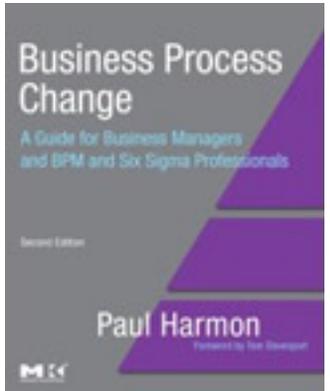
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Business Intelligence and Mining Techniques

Business Intelligence and Data Mining techniques – two terms that are really just two different names for describing the same underlying approach - have been around since the early Nineties. It was one of the more successful spinoffs of the interest in Artificial Intelligence that was popular in the Eighties. One could say that AI is, in essence, about smart search techniques. One searches a rule-base in an expert system to generate a recommendation. In one version of expert systems, one examines a series of cases to find out what they have in common, as a first step to generating a prescription for similar cases. Each time a case is examined and a recommendation is given, the system becomes a little bit smarter and is better able to suggest a recommendation when it is given a new case.

In the early Nineties, developers with an AI background began to apply these types of search algorithms to looking for patterns in databases. Imagine that each customer shopping at a large grocery store constitutes a case. Imagine the grocery chain is using checkout software that allows it to enter information about the customer such as various demographic characteristics, the date and time of purchases and the products purchased. (Remember all those programs that got you to sign up to buy at a discount, in exchange for your filling out that application providing information





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about yourself?) As more and more data is accumulated, the Data Mining or Business Intelligence system begins to group customers and identify characteristics about each group. Some of the observations may be obvious: Customers with addresses in the wealthier areas buy more expensive items, on average. Some may be less obvious – women who shop on Thursday afternoons buy a lot more cereal, or never buy cheese. In other words, BI or Data Mining programs search databases and identify generalizations that a human might never think to look for, or notice. Some of the correlations will be irrelevant, but some might allow the store to rearrange its shelves or establish discounts that will improve the shopping experience for customers, make more money for the store, or both.

Companies were established to sell BI or Data Mining software in the early Nineties. One thinks immediately of companies like Business Objects, Cognos and SAS, for example. Most of these early BI or Data Mining companies were focused on the data warehouse market that flourished at the same time. The idea was that an organization should pull all its data together in a large relational data base, clean it up, and then turn a BI or Data Mining tool loose to find new insights the company might use to improve the way it did business.

When Business Process Modeling software products were first introduced the vendors emphasized that the tools were like workflow or enterprise application integration (EAI) tools and that they would allow organizations to model processes and then control the execution of the processes at runtime – as existing workflow and EAI tools did. Most of the vendors, in passing, said they would provide a Business Activity Monitoring (BAM) capability, using a term made popular by Gartner. Saying a product had

BAM usually meant that the process tool would keep data about instances that were executed and then make that data available for the process manager. Thus, as with workflow, knowing that Bill answered 10 calls per hour, that Mary answered 15 per hour, and that Seth handled 20, provided the process manager with actionable information.

In the course of this decade the ambitions of the BPMS vendors have grown rapidly. Today, I am as likely to speak of BPMS Platforms as to speak of tools or suites. Companies like IBM, Oracle, SAP, TIBCO and Software AG are rapidly acquiring companies and assembling more and more comprehensive suites of tools to provide organizations with a wide variety of tools that will allow the organization to tackle almost any imaginable process redesign, maintenance or management problem.

In the course of expanding their ambitions for BPMS, the leading vendors have all begun to realize they need a stronger monitoring, summarizing and reporting capability. If you want to create a dashboard for the VP of Sales, or for the executive managing your worldwide supply chain, you need quite a bit more than BAM and the data derived from the execution of a specific process. You need warehouse data, customer survey data, up-to-the-minute data on orders received and orders shipped, etc. In other words, you need access to your organization's data warehouse and you will also need a tool that can sort through all the data and identify cases (let's call them problems demanding attention) you should focus on. While you are at it, you'd like the dashboard to not only flag problems, but to recommend solutions that might be appropriate. Given these concerns, it's not surprising that, in the past few years, the leading BPMS vendors have started buying up the leading BI and Data Mining vendors. To give only three examples, in

2007 SAP acquired Business Objects, TIBCO bought Spotfire, and IBM bought Cognos.

Most of today's leading BPMS packages include Business Intelligence and Data Mining capabilities and will be adding more in the future.

But the story doesn't stop there. In the course of this decade, researchers have begun to apply the algorithms underlying BI and Data Mining to processes themselves. This new area of research is often called "Process Mining" or "Process Discovery." In essence, the software looks at a database with information about events and constructs the process that must be generating those events. Companies that don't know exactly how their processes work can now be presented with pictures that suggest the "activity nodes" that are apparently taking inputs and generating outputs. In addition, they can provide lots of other useful information. You may imagine that your process looks rather like the workflow diagram you have on your wall. In a reasonably short time, a process mining tool can generate a diagram that shows what your process flow really looks like. It often turns out that exceptions, rejects, special processing requests, and orders on hold generate a picture that is much different from what you imagined. And, obviously, such a picture can help a process manager spot problems and bottlenecks that call for attention if the existing process is to be made more efficient.

There is a website - processmining.org – sponsored by the Eindhoven Technical University Process Mining group, a leading research group focused on process mining problems that offers quite a bit of information about process mining and an open source tool, ProM, which readers can use to learn more about the technology.

In addition, the IEEE has just set up a task force to promote the understanding and use of process mining.

Two vendors, Fujitsu and Pallas Athena, have begun to emphasize the fact that their products incorporate powerful Process Mining capabilities, and more will soon follow.

Over the course of the past few years BPTrends has published a wide variety of articles on Business Intelligence, Data Mining and, more recently, Process Mining.

These subjects can become very technical very quickly, involving as they do, complex data processing algorithms. Those involved in the use of BPMS will need to know enough to make intelligent choices among the next generation of BPMS suites and platforms. Business people will hardly need to understand the technical aspects of BI or mining, but they will certainly want to know what the tools can do and when their use can identify problems that require attention, speed the completion of projects, or support better decision support systems. BPTrends will keep publishing articles on all aspects of BI, Data Mining and Process Mining in an effort to keep our readership fully informed on these important, rapidly developing techniques.

Here are a few articles that will prepare readers to better understand these interesting developments in intelligent decision making and decision support.

[Business Activity Monitoring](#) - Paul Harmon - February 18, 2003.

This Advisor discusses Management Dashboards or Business Activity Monitoring (BAM), and provides a brief overview of the concept, how it is being used today, and where it is going in the future.

Optimizing Supply Chain Processes -

Curt Hall - February 03, 2004.

In this issue of BPTrends, Curt Hall, our Guest Editor for February, provides an overview of how some companies are using Business Intelligence (BI) to monitor and measure supply-chain operations. This has resulted in a new analytic field called supply chain intelligence (SCI). This survey allows business managers to examine the value these new techniques might provide if applied to their own business processes.

June 2004: Business Process

Intelligence - Curt Hall - June 01, 2004.

This BPTrends Newsletter was written by Guest Editor, Curt Hall. It focuses on Business Process Intelligence or BPI. This new approach to process management, monitoring, and improvement represents a fusion of traditional Business Intelligence and Business Activity Monitoring techniques with some newer techniques required to meet the demand for presenting information in a more process-centric context. Similarly, here's a great overview of how simulation systems can be used to make predictions about processes.

Business Performance Management

Keeps Evolving - Paul Harmon – October 31, 2006.

Evolving in parallel to Business Process Management and BPMS, Business Intelligence (BI) vendors have continued to use the term Business Performance Management to refer to providing performance information to senior executives. Recent consolidation moves suggest that this segment of the market is evolving rapidly.

Competing on Analytics by Tom

Davenport and Jeanne Harris – A

Book Review by Paul Harmon - July 03, 2007.

Tom Davenport and Jeanne Harris have written an important book that looks at Analytics and discusses how some smart companies are making more money owning information about an asset, than owning the asset itself. Every business executive will want to read this book. If your company isn't investing in Analytics, then you owe it to yourself to consider what's involved, and determine whether or not you should be.

Business Activity Monitoring - Venugopal Juturu - September 04, 2007.

In this comprehensive and clearly written article, Venugopal Juturu addresses the challenges addressed by BAM, discusses some implementation benefits, and provides a practical approach to achieving a BAM solution within your organization.

Fujitsu's Process Discovery Technology - Paul Harmon - June 10, 2008.

Fujitsu has just introduced a new automated approach to process modeling. It's impressive and it reminds us of how much better BPMS products can be. At the same time, it can lead to some interesting insights into what business analysts actually do.

Process Discovery Technology: A Comment on Paul Harmon's June 10 Advisor - Wil van der Aalst - July 01, 2008.

In this Article, Wil van der Aalst responds to Paul Harmon's Advisor, Fujitsu's Process Discovery Technology. While applauding Fujitsu's efforts in process discovery technology, he points out that such tools have been available in the academic world for quite some time and discusses some likely future developments.

Till next time,

Paul Harmon

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