

CASE STUDY

The Path Toward Pervasive Business Intelligence at Avantium

Sponsored by: TIBCO Spotfire

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SUMMARY

The trend toward evidence-based decision-making is taking root in commercial, non-profit and public sector organizations. Driven by increased competition due to changing business models, deregulation or, in some cases, increased regulation in the form of new compliance requirements, organizations in all industries and of all sizes are turning to business intelligence (BI) and data warehousing (DW) technologies and services to either automate or support decision-making processes.

An increasing number of organizations are making BI functionality more pervasively available to all decision makers, be they executives or customer-facing employees, line-of-business managers or suppliers. IDC defines pervasive BI as follows:

Pervasive BI results when organizational culture, business processes and technologies are designed and implemented with the goal of improving the strategic and operational decision-making capabilities of a wide range of internal and external stakeholders.

Despite the fact that the term Business Intelligence was first coined in 1958 and the first BI software tools emerged in the 1970's, BI is not truly pervasive in any organization. As organizations identify more stakeholders who can benefit from improved decision-making capabilities, they are choosing to deploy BI and thus come increasingly closer to achieving pervasive BI. For organizations struggling with changing organizational structure and culture, business and IT processes and technologies, several lessons can be learned by examining the best practices organizations employ on their path toward achieving pervasive BI.

METHODOLOGY

In 2008 IDC launched a global market research project with the goal of uncovering best practices in expanding the use of BI and analytics processes and technologies. The research project was underwritten by eleven competing BI software, services and hardware providers. The project methodology, which was developed by IDC and contributors from Boston University School of Management Information Systems department included both a survey of over 1100 private and public sector organizations in 11 countries and in-depth interviews with 22 of these organizations resulting in a series of case studies on best practices in achieving pervasive BI. One of the organizations interviewed was Avantium.

ORGANIZATION

Founded in February 2000 as a spin-off from Shell, Avantium specializes in research & development services for applications in the energy, chemicals and pharmaceutical industries. Headquartered in Amsterdam, the Netherlands, the company provides research services and tools to more than 70 companies worldwide. Avantium focuses on developing products in two fields: new biofuels and bio-based chemicals, and new crystal forms of marketed drugs under patent. Avantium's investors include a number of venture capital firms and a unique consortium of strategic shareholders including Pfizer, GSK, Eastman Chemical, WR Grace and Akzo Nobel who joined as strategic partners and invested in Avantium. In 2006 the company had 100 employees and estimated revenue of €13.5 million.

SITUATION OVERVIEW

Business Drivers

Like all organizations that took part in IDC's research project, Avantium was influenced by both external and internal factors that triggered a need to re-evaluate its decision-making processes and the supporting BI and analytics technology architecture. In the case of Avantium, these business drivers were both strategic and operational.

Strategic

Avantium's success as a high-throughput research and development (R&D) services and technology provider to the pharmaceutical, oil, and chemical industries depends on its highly skilled staff, specialized methodologies, and processes. As a mid-sized company, Avantium is not hampered by the decentralized organizational structure of most large corporations. Nevertheless, the company is highly dependent on effective decision-making across its major business departments in an environment that includes large volumes of complex research data and an ongoing need to manage corporate performance from financial, customer and employee perspectives.

On the surface the BI and analytics needs of a R&D department and those of marketing, sales, finance and operations are very different. Yet, evaluating decision processes can uncover certain similarities that can benefit from the same type of BI technology. In the case of Avantium, it was the need to support ad-hoc analysis or exploratory discovery through flexible and user-friendly software that exposed an opportunity to extend the company's existing investment in BI software from R&D to other departments.

Operational

Prior to 2006, Avantium had a fragmented ERP applications architecture. In July 2006, the company started an ERP consolidation project, which by the end of the year resulted in the implementation of the Microsoft Navision enterprise application suite. ERP consolidation projects help improve efficiency of IT resource allocation and introduce new software features and functionality. They also result in the consolidation of the types of data sources that feed into the BI and analytics software platform and ease the usually costly and time consuming efforts needed to make cross-domain data analysis possible.

Implementation of Navision at the end of 2006 was not in itself a trigger to improve the technology for BI and analytics. However, it did drive the process to reassess the query, reporting and analysis functionality needed to support decision makers at all levels of the organization. Avantium needed a flexible analytic system to surface the ERP data. On completing the requirements-gathering process across five of its departments outside of R&D, a finance sub-group led by David Jim, the corporate

controller for Avantium, found that creating reports in Navision wasn't a feasible option. The issue was that the varying needs of business decision-makers would have required the development of too many different reports, which in turn would need to be changed as user needs changed.

SOLUTION

Towards Pervasive Business Intelligence

To address its BI and analytics needs, Avantium embarked on a path towards pervasive BI that would require changes to the organization's culture, technologies, and business and IT processes.

Organizational Culture

As a R&D services and technology company, Avantium has a general culture of making informed decisions instead of relying on instinct or 'gut-feel' of a few decision-makers. Such a culture is usually conducive to expanding the pervasiveness of BI, but can only succeed in this goal if suitable business and IT processes are enabled by appropriate technology.

In expanding and enhancing its BI and analytics solution, Avantium had several goals that included:

- ☒ Improving the timeliness and granularity of data availability to support ongoing project performance measurement. Avantium is a project-based company that works on many concurrent projects. Given the resources that go into each project, effective management of the project portfolio from both executive and individual project manager levels is a key success factor. It requires ongoing measurement of budgeted and actual costs and hence timely availability of cost models at different phases of any given project. Prior to the new BI project, users were dissatisfied with the latency of information. Although they had access to the right information, it did not arrive at the users point of access soon enough to always be actionable.
- ☒ Pushing decision-making responsibility to lower levels of the organization. By implementing a new BI and analytics solution, Avantium wanted to enable more employees to make decisions based on consistent metrics and data models that reinforced corporate goals.
- ☒ Influencing how departments communicated with each other. Avantium was looking to BI and analytics technology to enable collaborative analysis and decision-making. It wanted technology that facilitated sharing of information.

Technology

Avantium's first step on the path toward pervasive BI was the realization that it needed software other than the ERP system for performance management, analytics, and reporting purposes. Initially, the team began using an Excel Add-in software product, which connects Excel directly to the Navision data repository. Although it was a low-cost reporting alternative, the team responsible for the BI solution felt the tool was only suitable for basic financial reporting. The need for more query and analysis functionality led Avantium to evaluate two BI solutions.

Following two pilot projects, Avantium selected TIBCO Spotfire enterprise analytics software. Not only was the TIBCO Spotfire software more flexible, but it took ten times less time to create the pilot than with the competing BI software. Spotfire was also the incumbent BI and analytics software used in Avantium's R&D department. This meant that Avantium had existing technical skills and expertise with the tool and the BI team was also able to rely on the experience of its research colleagues.

Business and IT Processes

Following the pilot in July 2007, Avantium's new BI and analytics project started in October 2007 and was completed in December 2007. By this time all 70 users had access to the Spotfire applications.

Avantium's infrastructure is relatively uncomplicated, which reduced the challenges in implementing a BI and analytics solution. Avantium was able to run Spotfire without building a data warehouse, instead deploying the software directly on Navision's SQL Server-based data repository. As a result all users have access to real-time information.

During the initial development and deployment project, Mr. Jim acted as the project manager whose tasks included interviewing a representative user from each department and translating user requirements for application customization. A key to the success of the project was strong management support and a strong working relationship between the BI group and the IT department, which supported the connection of Spotfire to SQL Server. In addition, supporting personnel from Spotfire assisted with the implementation. Having established the link between Spotfire and SQL Server, the IT department is minimally involved in ongoing support for the BI and analytics solution.

BENEFITS

As David Jim put it, "In our business, we have always been very data dependent, but now we have real insight about the performance of operations." In other words, Avantium is on its way to providing the right information to the right people at the right time using the right tools.

The Right Information

- ☒ The new BI and analytics solution has improved the consistency and timeliness of information available to decision makers. But it has also had the indirect benefit of surfacing ongoing data quality issues. For example, seeing outliers on an interactive chart enables users to drill into the detail of the data and take corrective action on any data quality issue in any source operational system.
- ☒ Additionally, better data granularity has enabled users to drill-down into the information rather than relying only on aggregated report summaries. As a result, business users don't have to rely on information management specialists or IT for custom report development and IT is free to perform other higher value-added tasks.

The Right People

- ☒ The TIBCO Spotfire deployment has resulted in the expansion of the BI functionality from R&D to business, finance, operations, and HR departments. This includes an additional 70 users across the company, including the executive management who use Spotfire software for performance management purposes. "At this point we have achieved full deployment of the Spotfire software," said David Jim. "Ongoing efforts will be focused on adding new analytic applications and implementing additional features as they become available in new releases of the software."
- ☒ In addition, Avantium use the same TIBCO Spotfire software for external reporting to shareholders, investors, and the board of directors. These external stakeholders see both graphical and tabular information on the company's performance. Using the same tool for both internal and external business intelligence enables Avantium to decrease the friction that exists when multiple decision-makers rely on differing information assets to communicate among themselves and to better facilitate communication among the various parties as they engage in collaborative analysis.

The Right Time

- ☒ Although Avantium has always had a large amount of data available for input into a BI solution, disparate enterprise applications made the delivery of detailed data to business decision-makers a challenge. In fact, business decision-makers often received outdated data that in turn didn't allow them to take necessary actions on a timely basis. Part of the issue was the need to expand considerable manual effort to build custom reports when specific information requirements arose. With TIBCO Spotfire, Avantium was able to provide its users with a self-service tool with flexibility to slice and dice the data as needed.
- ☒ To support right-time information delivery, Avantium has implemented both a pull and a push mechanism. In the former scenario, business decision-makers log into the TIBCO Spotfire analytic application on an as-needed basis. In the latter scenario, emails with links to weekly and monthly reports are pushed to business decision-makers based on their individual preferences, whereby users launch their respective analytic application through the distributed links to evaluate key metrics such as pipeline updates or project performance measures.

The Right Tool

- ☒ The primary benefit of TIBCO Spotfire analytics software was its flexibility, as evidenced by the interactivity and visualization features. For example, even a relatively simple feature for displaying data details when scrolling over bars on a chart made a difference in user satisfaction and contributed to enterprise-wide adoption. As a result Avantium provided only very light training for its users who found the applications self-explanatory.
- ☒ ERP systems are designed to handle transaction processing. Mr. Jim notes that "ERP is good for data input, but not for real-time performance management. Our information needs change frequently. It would be a waste of money to invest in static reports." Therefore, Avantium decided that they needed a layer, in the form of a separate BI and analytics software product, on top of the ERP system.

LESSONS LEARNED

IDC's goal in interviewing Avantium was to identify best practices that other organizations can apply in their efforts to make the use of BI and analytics processes and tools more pervasive. Neither Avantium nor IDC would claim that Avantium has fully achieved the goal of having truly pervasive BI. Nevertheless, there are several important lessons that the Avantium case highlights:

- ☒ Providing access to the BI software to all employees is not only the measure of pervasiveness of BI. Avantium's deployment of TIBCO Spotfire reaches almost all employees. Nevertheless, the company continues to look for new and better ways of exploiting analytics to its advantage. Obviously not having the appropriate BI and analytics software makes this task impossible.
- ☒ BI and analytics projects never stop. The deployments are always incremental and ongoing. In the case of Avantium, the company moved from stand-alone Excel to a packaged Excel add-in to TIBCO Spotfire.
- ☒ Not every BI and analytics project requires the development of a data warehouse. Speed of deployment and flexibility in addressing ongoing user requirements can sometimes be achieved with an approach to BI where real-time information is exposed by deploying the BI software directly on the underlying application's repository. The need for a data warehouse may surface at some point, but it should not always be a pre-requisite for launching or expanding a BI and analytics project.

- ☒ The three most common query, reporting and analysis requirements include static or parameterized production reporting; advanced analytics, such as statistics and data mining; and ad-hoc or exploratory analytics, including multi-dimensional analysis. The latter has usually been associated with online analytical processing (OLAP) technology that requires pre-building of data cubes. Consider alternatives to traditional OLAP technology when the requirement calls for multi-dimensional analysis. In the case of Avantium, the company's approach to deploy Spotfire directly on the Navision repository rather than creating OLAP structures, met the company's need for flexible multi-dimensional analysis.
- ☒ To understand what technology is most appropriate for your organization, evaluate your organization's decision processes and the level to which a common understanding of data and processes exists. For example, static or parameterized reports or dashboards are well suited for processes and metrics that are very well defined. However, the same technology is not conducive to supporting decision processes that involve ad-hoc, exploratory investigation of data and root-cause and what-if analysis.
- ☒ Organizations in certain industries are more likely to have a culture of fact-based decision-making supported by BI and analytics technology. Avantium's focus on R&D services & tools as its core business is such an example. If this cultural alignment with BI is not present at the corporate level, the key to success is to find a business unit or department that is most 'numbers oriented' in its management practices, secure support from the head of that department and proceed with an incremental development and deployment strategy. Once one business unit has access to appropriate BI assets, begin promoting the newly gained improvements in BI to other business units. Eventually, sharing information based on a common understanding of data, metrics and business processes will lead to an expansion of the BI technology deployment.
- ☒ Align IT strategy with organizational culture. If the organization is decentralized, don't force all IT functions into a single centralized group. Such a group is highly unlikely to be able to support the ongoing and often-changing requirements of all users on a timely basis. The central IT department is much better suited for enterprise-wide efforts such as data integration and data quality projects and as a key member of a central data governance group. Clear articulation of the roles and responsibilities of each group will go a long way in preventing conflict between central and business unit IT groups.
- ☒ Data governance is perhaps the single most important task for assuring BI and analytics project success. Without a common set of terminology, metrics, and key data elements, even the best-intentioned organizations with the latest software tools will fail in their BI and analytics efforts. Establishing a data governance group that consists of both business and IT staff will also enable sharing of information – another key characteristic of organizations further along on the path towards pervasive BI. In this case, having a single ERP system, which may be a realistic goal for small and mid-sized organizations, helps.

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