



# Games that Matter: User Experience that Leads to Insights

TIBCO Spotfire, TIBCO Software Inc.

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### Games that Matter

More and more, business professionals have rich, visual, interactive user experiences with computer software outside the office. In 2008, 37% of U.S. consumers played video games <sup>1</sup>, and worldwide sales of video game software grew 11% <sup>2</sup>. By 2012 it is projected to be \$68.4B global industry. Among younger consumers the percentage of players and rates of growth were even higher. As a result, the people who increasingly make critical decisions in organizations have an entirely different expectation for human-computer interactions. Business professionals who play video games or spend time searching the Internet at home expect more than plodding form-intensive interfaces found at work. Equipping them to make decisions in an increasingly data intensive world is challenging Business Intelligence and IT professionals to rethink the way information is experienced.

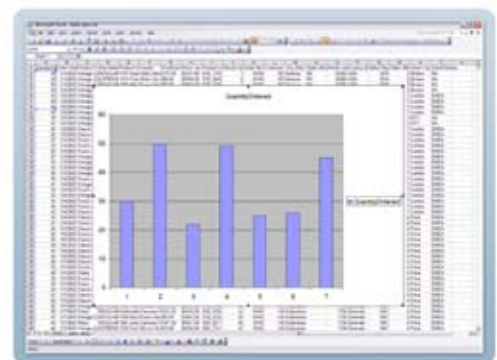


World of Warcraft by Blizzard Entertainment

### The Problem with Business Software

Will game-like experiences be the norm in future business software? The answer is increasingly “yes”. The principles of visualization, interactivity, immediate feedback, and contextual presentation of data that reflect the user’s role, task, and situation, are simply too compelling. Being fun helps, too.

The problem with business software is that unlike game software, it is not typically optimized for how the user experiences the information. Instead, it is designed to optimize navigating the features of the software. Insufficient thought is given to taking advantage of how human beings process information to derive the greatest insight and take action in the context of a specific decision-making scenario.



The most persuasive user-experience in business

<sup>1</sup> Paul Jackson and T.J. Keitt, *Understanding the US Video Game Player*, Forrester, January 25, 2008

<sup>2</sup> *Top Global Markets*, NDP Group, February 2, 2009.



Consider the common business intelligence systems report. Getting one produced – asking the right questions in the right ways, isolating the right information, formatting it for delivery – is painful in its own right. Once delivered what is the typical user experience? In most modern BI systems the designers have anticipated that the user will have some immediate additional questions. For example, presented with some aggregate sales data, the user has the ability to “drill down”. But is that how a game works? No. Presented with a fork in the road the game user can go back, forward down either fork, or explore their surroundings. The game designer does not presume to know which of these the user might choose. Instead, the data available in that context drives the presentation. As the user makes a choice new data, perhaps food, fuel, or useful a tool, appear in the ever changing context.

Not surprisingly, this is the experience business professionals increasingly want. “Drilling down” is one choice (go down a path) but another is to modify the original report without requiring anyone else to generate a new one (go back). Another is to add new data to an existing analysis (create your own path). One more is to filter the data represented in the report by some statistical algorithm to determine its relevance (pick up a tool). Yet another might be to capture the report as one view of an analysis that can be published for others to see and explore collaboratively in a specific decision-making scenario (go down another path hand in hand). Rather than “drill down” some predetermined path decision makers want more “free dimensional” exploration that presents new context-aware options as each choice is made.

### **Those Days are Over**

When decision making was thought to be the job of a relatively few number of executives, managers and professionals, the job of analyzing data could also be specialized. Analysts and power users could be trained in the arcane interfaces of computer software and reporting, allowing IT to concentrate on the difficult job of finding, cleaning, aggregating, and delivering the data. Those days are over.

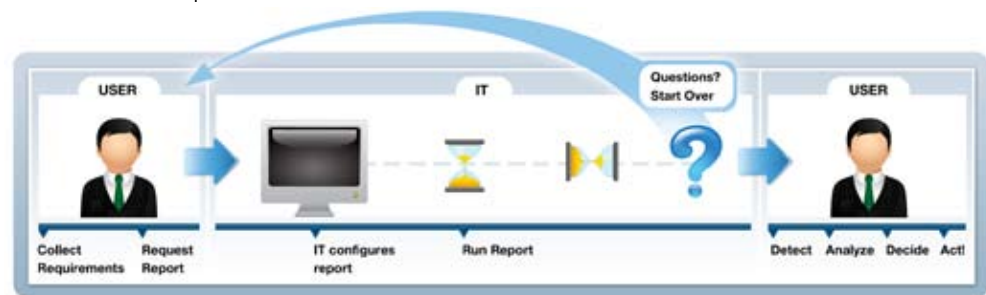
Today, the demands of global competition in an information economy and the need for higher productivity mean that every job is inundated with information; and it is everyone’s job to understand the information and make decisions. Without the time or interest to learn complicated software and with expectations for software experiences built on more interactive software experiences outside work, these decision makers want more control and software that works the way they think.



For IT, and particularly business professionals, these growing expectations pose a problem. Certainly the challenge of useful information delivery is substantially diminished by the attention it has received to date. However, BI technology optimized for information delivery does nothing to meet game-like expectations among business professionals. The challenge of enabling business professionals to make optimal decisions with the information delivered has truly just begun.

### **Don't Slow Me Down While I Go Around You**

Once given good information, users do not hesitate to tackle the user experience problem themselves. Spreadsheets have become the tool of last resort for BI data. A few spreadsheets quickly become "spreadmarts," uncountable instances of data analysis throughout the organization. More complicated spreadsheet applications follow, sometimes supported by IT sanctioned personnel and more often by an informal army of specialists whose varying skill level, access to data, and tenure put the utility and security of their work at frequent risk.



*Answering new questions with traditional BI systems requires time-consuming processes with IT before users can get answers*

When spreadsheets aren't enough, users seek custom software from IT or commercial vendors. Sometimes using BI data as a source but more often creating custom data for a specific business process or decision making environment, these new applications commit the organization to expensive projects, maintenance, and new data management and integration investments amortized over a small group. In short, often without realizing it, organizations end up equipping decision makers with custom experiences that compound their data management expense rather than invest in a more productive information experience!



This last point is worth emphasizing. IT professionals have the opportunity – and the economic imperative – to leverage years of investment in improved information architectures, reduce risk and expense, and improve the corporate decision making process by guiding business professionals to better choices. By complementing or displacing traditional information delivery oriented systems with newer systems that allow for richer, contemporary information experiences in the context of a specific business process, IT can demonstrate both savings and extraordinary business value. Ceding this territory to code-from-scratch development or spreadmarts exposes them and their organization to unnecessary expense and risk. Continuing to let users go around the inadequacies of current traditional BI systems rather than simply recognizing and fixing the problem with more adaptable BI is bad for business.



## Principles to Experience

Today, front-line business professionals are making more top and bottom line business decisions, increasing the demand for relevant, real-time, domain-specific data delivered in a game-like free-dimensional experience. How might that be accomplished? The principles of better BI user experiences begin with VIIC: Visual, Interactive, Immediate, and Contextual.

### Visual

Humans best process and intuit information by seeing and interacting with data and exploring patterns and relationships. Traditional business analysis software is not set up to take advantage of these natural cognitive and perceptual abilities. The complex and multifaceted layers of business information are usually presented in a flat and static format. This forces users to remember things seen once in order to understand data seen in another view; even though most people can hold no more than seven separate units of information in short term memory at one time. "Vacant, low-density displays, the dreaded poster-ization of data spread over pages and pages, require viewers to rely on visual memory, a weak skill, to make a contrast, a comparison, a choice."<sup>3</sup>



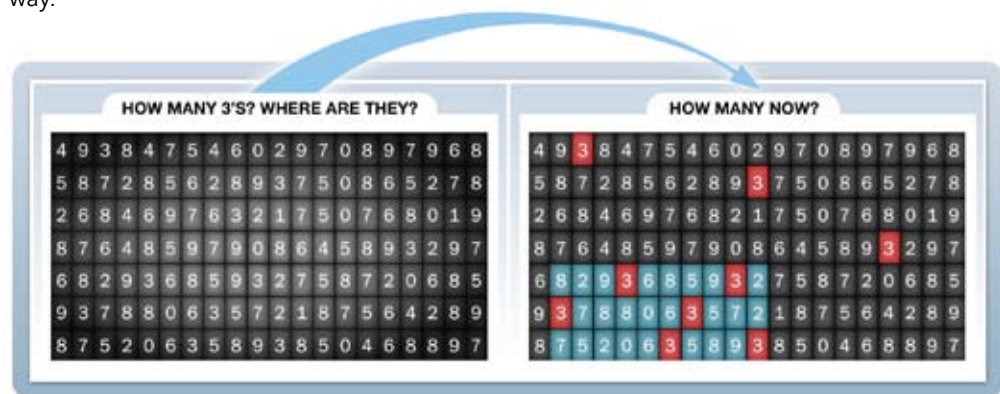
*The TIBCO Spotfire experience*

<sup>3</sup> Edward Tufte, *Envisioning Information* (Cheshire, CT: Graphics Press, 1990)



Effective visuals, by comparison, can give users a sense of large and complex data sets that cannot be managed any other way.<sup>4</sup> In addition, the automatic processing of visual information is high capacity and characterized by targets 'popping out' during a search.<sup>5</sup>

Visualization improves understanding because the human brain excels at processing images and recognizing patterns. The visual cortex dominates perception, and key aspects of the perception process occur rapidly, without conscious thought. Contrast this with how the brain handles rows and columns of numbers and letters. It takes a good deal of time to digest a set of interrelated numbers and it is easy to miss crucial information displayed this way.



Visualization techniques make spotting new insights and answering questions fun and easy

### Interactive

Most business intelligence software requires a user to form a question and send the query through IT or an analyst and wait for an answer, usually formatted as a spreadsheet or static report. If the analyst is experienced, the answer will often include some unasked for information because they have learned to anticipate. If the question changes mid-stream or the resulting report prompts new unanticipated questions, the process starts over again. This process can take days or even weeks.

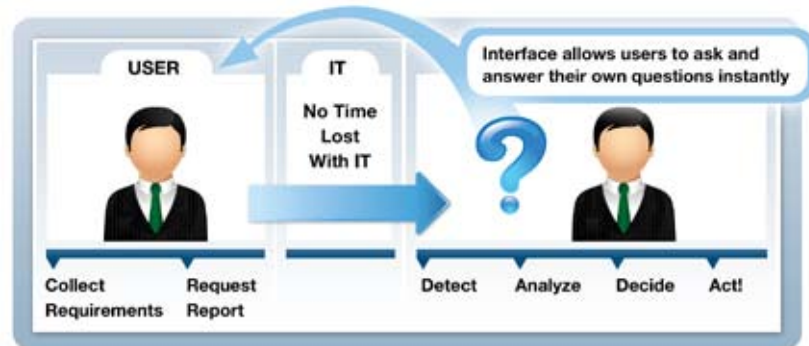
None of these things - separating the business professional from the data, delaying answers to new questions by even minutes let alone weeks, or constraining interactions to an anticipated set of drill downs - facilitate optimal decision making. Instead, the individuals who best understand and would most benefit from free exploration rarely gain an appreciation for the depth and subtlety of the underlying business information.

<sup>4</sup> Edward Tufte, *Visual Display of Quantitative Information* (Cheshire, CT: Graphics Press, 2007)

<sup>5</sup> Stuart K. Card, Jock D. Mackinlay, and Ben Shneiderman, *Readings in Information Visualization: Using Vision to Think*, (San Diego: Morgan Kaufman Publishers, 1999)



Valuable time is lost. Critical and timely insights that could lead to competitive advantage are missed. Designating an IT professional, who does not have the business context, to repeatedly structure queries and format reports, guessing what the “end user” might want next, is also a tremendously inefficient and expensive use of talent.



*User-driven interactivity improves self-service, removes lengthy IT bottlenecks and speeds decision making.*

Like the game player who stops at the virtual fork in the road to consider her options, the ability to review, query, and interact with the data must be in the hands of the individuals best poised to understand the insights uncovered. Front line business users have the domain expertise to ask the best questions, revise working theories on the fly, filter specific information, and extract relevant insights. They cannot exercise their expertise or their intelligence unless the software they are using to visualize information also allows them to explore interactively and unencumbered.

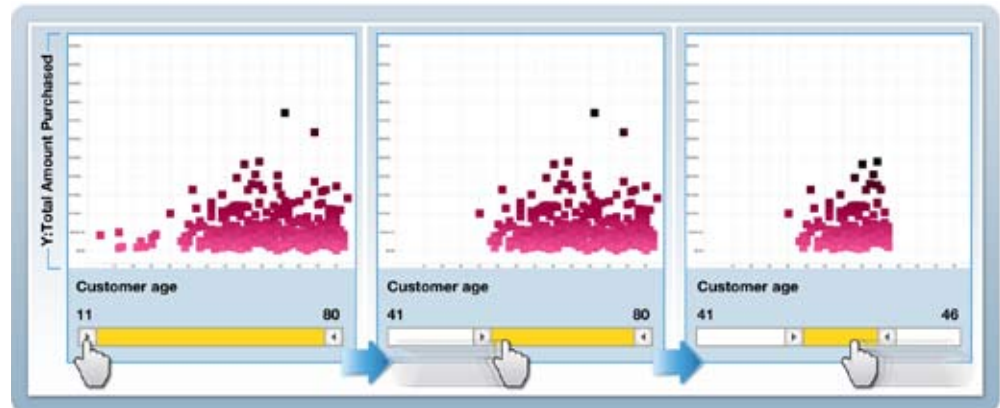
### ***Immediate***

It may not be possible to know the future, or predict it perfectly even with the most sophisticated algorithms, but it is possible to know what just happened virtually anywhere in the world. Information traveling at light speed can be monitored, parsed, formatted, statistically filtered, and delivered to a decision maker's user experience within moments of its creation.

This need for speed is not limited to information delivery. For visual and interactive user experiences to be effective actions must occur within certain time constraints: For example, cause and effect relationships (such as pushing a button and confirmation that it has been pushed) need to happen within 0.1 seconds. This connection between action and reaction



draws users into a sense of shaping the digital information with their fingertips. They can change a query mid-stream, ask previously unimagined questions, and feel connected to the discovery process, as well as gain an appreciation for the depth and richness of the information.



*Instantaneous response to user filtering answers to questions as they arise*

Eliminating or significantly reducing lag times in human-computer interactions creates a conversation-like cycle of demand and response. Such a cycle allows business professionals to derive new insights and make better decisions. It is also fun. As any game player knows, when you get an immediate response to your first question, the reward is that you get to ask another, accumulating the knowledge needed to win. That's how the game is played!



### *Contextual*

Business intelligence applications are often about the end state or the final report, not allowing users the opportunity for serendipitous visual, interactive, and immediate discovery that might transform a business decision. Pivot tables, spreadsheets, and prepared reports present data without context and can be confusing or difficult to interpret, even for users with a deep understanding of the domain in which the information is used.

It's no surprise business professionals have been motivated to contextualize their own use of information with custom spreadsheet applications, custom software development projects, and commercial off the shelf software. In a digitized world getting information is no longer the hardest challenge; the hardest challenge now is getting information into a context that allows us to make sense of it and to be able to share that information in context with others who need to act on it.

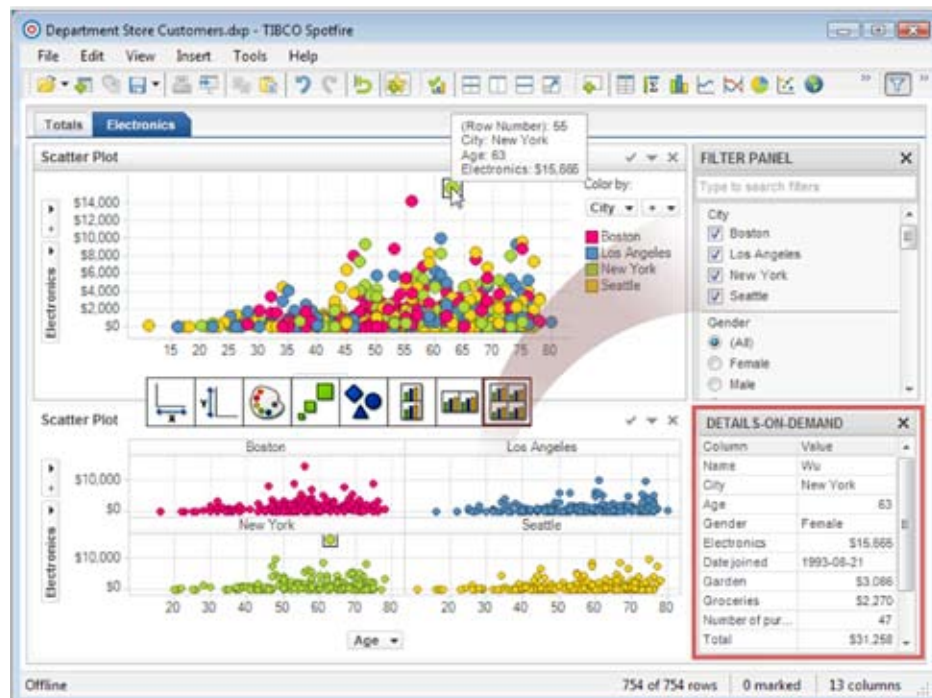
No principle of effective information experiences is more important than the principle of presenting data in the right context. The most stunning interactive, visual display of immediately responsive data is merely eye candy without context. Context has many dimensions.

Why? What? Where? Who? When? How? Why is information needed? What types of information are needed? Where in the process of solving the identified problem is a decision being made? Who is making the decision and who are the stakeholders? When must a decision be made? How will the decision be made and how will it be enacted? Complicated questions and answers to be sure but, as every game user knows when answered well by the software the resulting user experience can be a delight. Similarly, the right information context adapted to their particular work flow unleashes the collective intelligence and expertise of business professionals to quickly find insights collaboratively and make decisions that change the trajectory of businesses. For IT and business executives and professionals measured on ROI, growth, productivity, and market share that can be delightful, too.



## The TIBCO Spotfire Experience

At the intersection of data and game-like user experience lies discovery and differentiated decisions where business professionals can exercise left brain analysis and right brain creativity in symphony. Welcome to the TIBCO Spotfire® enterprise analytics platform and the Spotfire experience.



*TIBCO Spotfire applies leading principles of user experience to make data analysis fast, easy and intuitive*

The Spotfire experience applies the principles of game-like user experiences to data analysis: visual, interactive, immediate, and contextual. Just as the games are optimized for players, Spotfire® software is optimized for people and discovery rather than reporting.

From user and metadata management, to data access, mining, delivery, presentation, exploration, and distribution, to decision and business process optimization, the Spotfire experience always reflects an "outside-in" design perspective. The resulting "seamlessness" with which individuals and teams can interact and move about within a responsive data environment delivers the ultimate user experience.



## Visual

Visualizations are like calories; essential but occasionally bad for you. Unfortunately too many "inside-out" designed BI tools resort to eye candy visualizations that confuse rather than clarify. In contrast, the Spotfire experience is thoughtfully distilled from well understood data types: clusters, distributions, network relationships, trends, projections, geographical, geospatial, implicit and explicit hierarchies, and summaries.

Each visualization is n-dimensional, capable of displaying multiple aspects of the data with color, shapes, and sizes and handling multiple variables in the same visual with bars, lines, and markers. These powerful visualization properties are inheritable by customer created visualizations, too, allowing an unmatched degree of adaptability to different types of work without sacrificing the coherence of the user experience. The result is not a BI "chart room" but a "virtual reality room" that allows the user to turn over each artifact, examine each dimension, and let his/her mind wrap itself around the interesting and important information revealed visually in the different layers.



*Visualizations are not just for presenting findings, but are entirely interactive and user-driven, making them a powerful tool for spotting new insights.*



### *Interactive*

With such visualizations the opportunities for interaction are endless in Spotfire enterprise analytics. The Spotfire experience leverages contemporary, high speed, real-time as well as static data access technologies and in-memory processing to blow away “inside-out” design limitations that still require the well structured queries and hierarchies based on known dimensions and measures from the days when slow data infrastructure was the main problem.

Need to change an axis in your visualization? Filter the data differently? Create a nested hierarchy? It’s entirely point-and-click, drag and drop. The visualizations transform instantly, encouraging more questions and free-dimensional exploration. Concerned that memory capacity could be exceeded with gargantuan data sets? Spotfire software learns from the use and anticipates, gently “paging” additional data into memory to maintain the interactive Experience regardless of data quantity.

Want to apply calculations before or during an analysis? With the world’s most popular open source statistical language and the ability to apply standard or custom calculations interactively on the fly Spotfire enterprise analytics redefines what it means to interact productively with large and complex data. Is it a “multi-player” analysis? Collaborate easily across the web with TIBCO Spotfire® Web Player, allowing others to interact with the same data.



*Distributing analyses and interactive dashboards via the web takes only one click*

The result is an interactive experience that reveals insights and builds confidence in the decisions that emerge.



### *Immediate*

Interactivity without immediacy is time wasted. Speed is the hallmark of the Spotfire experience. Sub second response to most user actions rewards interactivity in a virtuous cycle of “ask and answer”. An in-memory engine and smart loading of data in gargantuan data scenarios are essential reasons for the immediacy of the Spotfire experience; along with the fact that Spotfire enterprise analytics sits on top of increasingly faster data management infrastructure that persist and manage the data itself. There’s more. Not all important data sits neatly in static data sources. In every profession new data is streaming in. Without support for it most BI systems ignore it, putting decisions at risk. TIBCO Spotfire embraces it. As events occur the Spotfire experience can be configured with rules-based real time business event processing. Fed to the Spotfire experience the way multi-level multi-player games feed gamers with the results of everyone else’s decisions, the business professional is alerted to conditions that require action and given the context to make their own decision. This Spotfire “business optimization” capability can be further extended with connections to other TIBCO business process automation products, completing the continuous circle of monitor-event-analysis-decision-action. That’s the power of now brought to your team’s desktops.



*TIBCO Spotfire analyzes data in motion*

### *Contextual*

In truth no one has visual, interactive, immediate “BI” experiences any more than anyone has a generic “game” experience. People have real life experiences that require analysis and decisions as they go about their business of selling and marketing, manufacturing, investing, or research. Their context

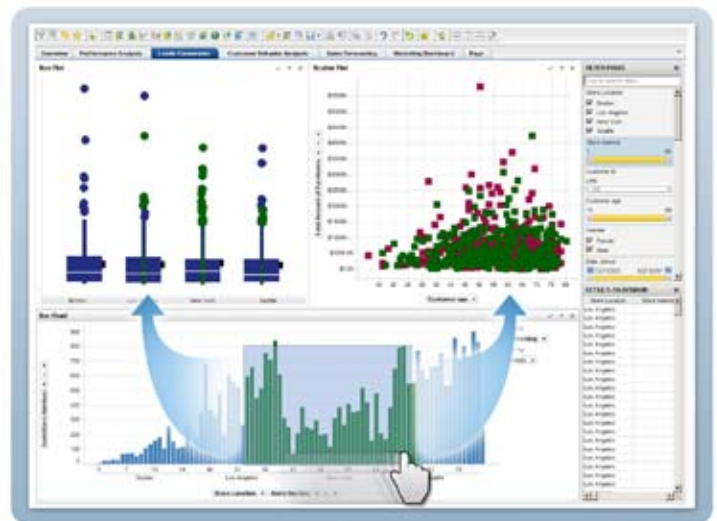
is infinitely varied: from genomics to energy exploration; national security to clinical studies; semiconductors to financial risk management. The list is as endless as work is diverse. The Spotfire experience therefore is ultimately your experience. To be yours it must be adaptable in the extreme.



In fact, Spotfire enterprise analytics is adaptable as no other BI system has yet conceived. It was designed knowing that the questions of why, what, where, who, when, and how it would be applied were unknowable in detail. Therefore, the Spotfire experience learns from your data and from use.

From the automated initial creation of filters when you first load your data to brush linked visualizations that allow those filter selections to sweep through the different views you have created Spotfire software wraps itself around your data and brings you almost instantly to the point of revelation, where things are revealed in your data that are completely new to you.

The “aha” moment stimulates a rush of exploration that the Spotfire experience also anticipates, allowing you to “bookmark” different perspectives as you construct a workbook of revelatory visualizations to share with others.



*Hidden relationships in data are revealed with brush-linking techniques*

In Spotfire software’s highly visual, interactive and immediate world your workbook becomes a guide for you and others to follow through your data. Eventually, you recognize that



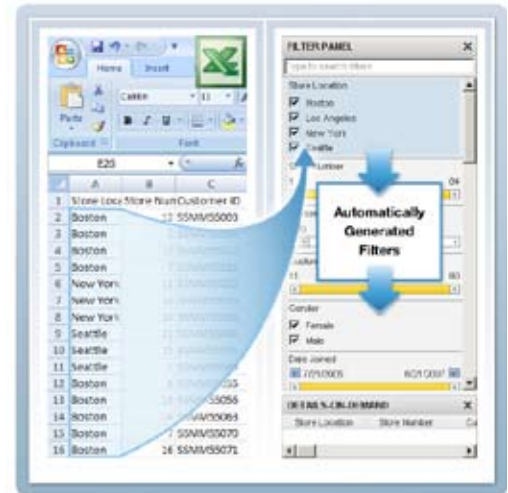
*Guided step-by-step analysis*

your workbook, perhaps by then customized with the help of others using Spotfire’s rich programmatic extensibility, is in fact the first of many contextualized “analytical applications” organically arising, though that is not what anyone your office calls them. Displacing BI reports, boutique software, and spreadsheet applications in concert with IT rather than in opposition, they help people make better decisions throughout your organization and transform your collective ability to compete. You realize that you have made the Spotfire experience your own.



## Executive Summary

Where might one find a BI platform that leverages current information architectures while delivering a visual, interactive, immediate, and contextualized experience to business professionals anywhere in the enterprise? What solution might there be to the problem of end users adding cost and information management risk by circumventing BI efforts? How might business and IT professionals help their organizations reduce unnecessary custom development expense and risk? The answer to these questions and to an even more fundamental question – how can we improve our corporate decision making in an uncertain world?



*Intuitive filters are automatically generated in Spotfire*

– is at work in the most progressive organizations today: TIBCO Software Inc.

As business professionals demand more game-like software at work and business executives seek to lower costs, improve productivity, and make better decisions in a fiercely competitive information economy, the Spotfire experience from TIBCO has the business intelligence user experience you seek.

Next generation decision makers are on the ground in your organization. They expect more from BI and they won't wait. Visual, interactive, immediate, and contextualized user experiences provide them with the better decision making – and fun – environment they want and need. Traditional BI? Game on.

Call 617-702-1602, email [mds@tibco.com](mailto:mds@tibco.com), or visit TIBCO Spotfire <http://registration.spotfire.com/eval/default.asp?source=uxwp> to download an evaluation copy today to find out how we can help you bring the Spotfire experience to your organization.



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