



# Agile business intelligence: reshaping the landscape

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October 03, 2013

*This report was underwritten by Tableau Software.*



Cloud

## TABLE OF CONTENTS

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Executive summary .....	3
Motivation and market definition .....	4
Evaluation methodology .....	9
Advanced visualization .....	10
Data-source agility.....	10
Domain-specific knowledge.....	11
Cloud support.....	11
Distribution-channel agility.....	12
Key takeaways .....	14
About George Anadiotis .....	15
About GigaOM Research .....	15

## Executive summary

The last few years have brought a wave of changes for business intelligence (BI) solutions. A set of redefining technological trends is reshaping the landscape from a slow and cumbersome process practiced mainly by large enterprises to a much more flexible, agile process that mid-market companies as well as individuals can utilize.

This report explores the key features that influence the evolution of agile BI and takes a look at the BI landscape under this light. At first glance, polarization seems to exist between traditional BI vendors, who are focused on extract, transform, and load (ETL) and reporting, and the newcomers, who are focused on data exploration and visualization, but a closer look reveals that, in fact, they converge as adoption of useful features is taking place across the spectrum.

This report will illustrate for both the traditional BI vendors and the newcomers that:

- As the market is expanding, features such as cloud support and embedded domain-specific knowledge in BI solutions are key. Initially, the benefits will be more obvious to those smaller players who do not have the resources for in-house infrastructure and extended internal projects and who are driven more by needing immediate results. Over the long run, however, these features can benefit all types of organizations.
- Ubiquity and mobility are key features of data today; therefore, the ability to support a multitude of data sources with as little effort as possible – integrating them and accessing analysis results via a multitude of channels – is important in order to keep up.
- We are shifting from static reports to interactive visualization. The focus is also shifting from having an overview of metrics to being able to discover what are the causes and effects of the phenomena the metrics express.

# Motivation and market definition

Over the last few years, cloud, Software-as-a-Service (SaaS), and Platform-as-a-Service (PaaS) adoption have been increasing for several reasons, including:

- Smaller startup costs
- Faster implementation time
- Reduced administrative overhead
- Increased scalability and reliability
- Flexible pricing models

Concurrently, we are witnessing an explosion in the amount of data generated and accumulated over time, a phenomenon that has been labeled “big data.” The need to deal with massive amounts of data is nothing new; in some organizations and contexts, data generation and accumulation has always been massive, and the need has existed not only to store it but also to derive value from it. What has changed is the extent of this phenomenon, both in breadth and depth.

More organizations produce and rely on data, increasing the breadth of the big-data phenomenon. While IT infrastructure can be applied to support the operation of organizations in every domain, in the past, only a handful of them could afford the financial and know-how requirements. Nowadays, we see not just small-to-medium enterprises but in many cases also individuals leveraging software tools and services to support a wide range of their activities, from communication and networking to human resources management and from accounting to logistics.

Organizations produce more data and rely more on data, increasing the depth of the big-data phenomenon. This doesn't apply just to legacy data being accumulated over time but rather applies mostly to an increase in the tempo of new data generation. As former Google CEO Eric Schmidt noted, every two days now we create as much information as we did from the dawn of civilization until 2003. This impressive increase can be attributed to new data sources for organizations, both internal (more activities being automated by software, thus more related data) and external (from sources such as social media or curated data sets).

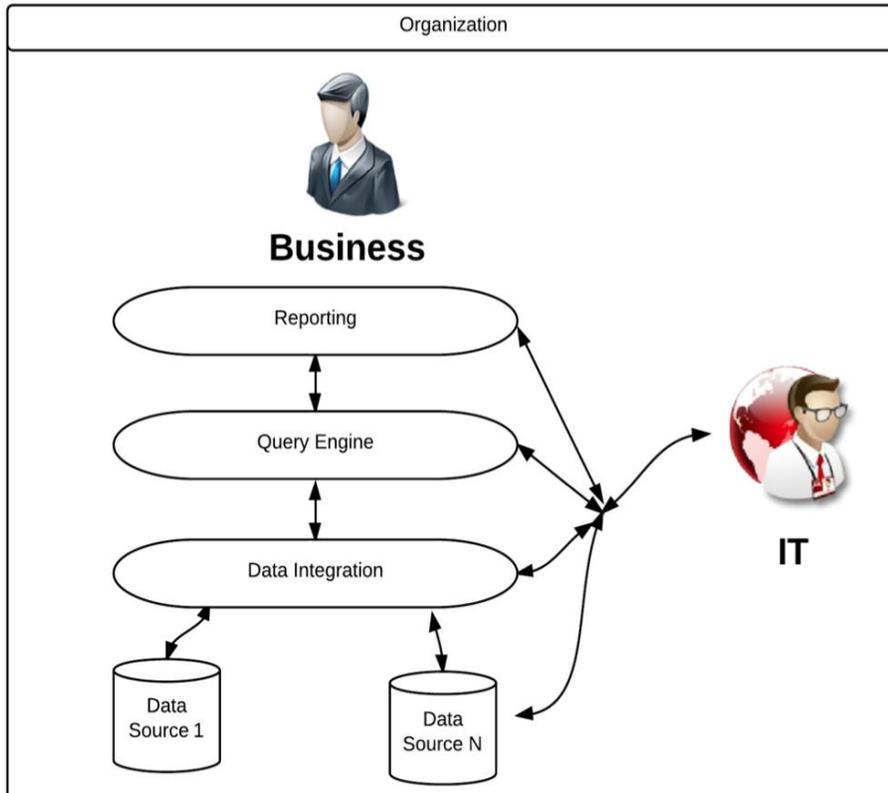
The rise in capabilities and the democratization of IT pose new opportunities and challenges. These factors are the backdrop against which BI solutions have emerged from a niche product addressed to high-level executives in large organizations to a widely used tool for decision-makers and teams at every operational level and in any type of organization.

Widespread adoption of business software such as productivity suites, customer relationship management (CRM) suites, and enterprise resource planning (ERP) suites has not only commoditized the software itself but also the associated skills. Now people are increasingly familiar with the data-generation process and increasingly able to make correlations and derive insights based on data.

Traditionally, BI solutions were addressed at organizations that needed them and could afford them — big enterprises with sufficient resources to acquire and sustain the in-house infrastructure and know-how required for their operation. To support this, those organizations needed an operational stack and associated architecture consisting of infrastructure, skills, and teams of skilled professionals.

In this kind of architecture, data must be integrated in enterprise data warehouses, leveraging heavy-duty hardware, specialized software, and skilled labor. Then it must be formed and interpreted according to the syntactic idiosyncrasies and limitations of the query-processing software that mediates it. This process, in turn, is mediated by a team of specialized professionals in charge of interpreting, formulating, executing, and presenting queries.

**FIGURE 1: Traditional BI: within organization, many layers, labor-intensive**

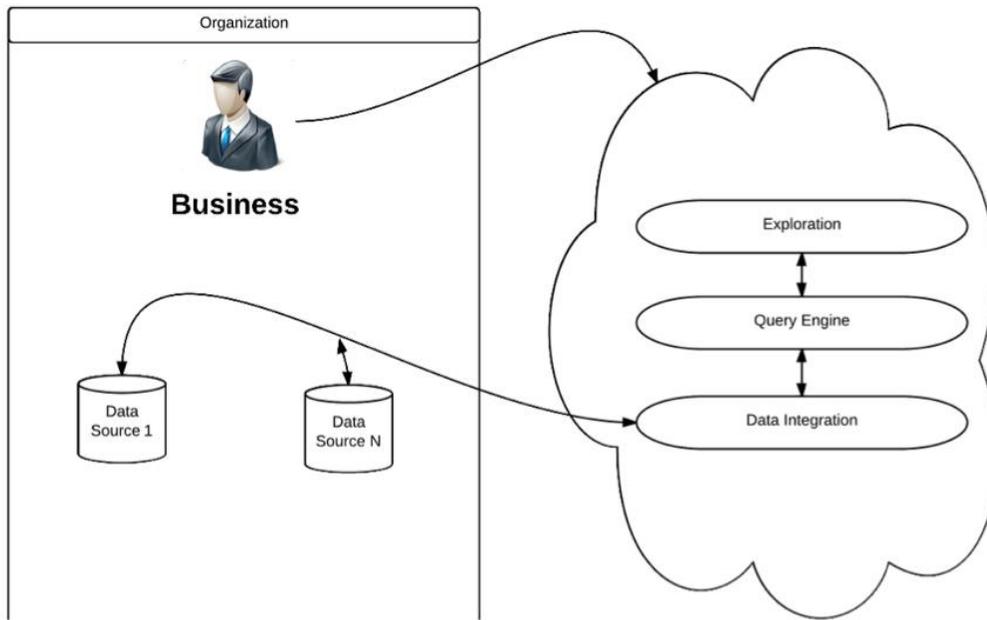


*Source: Linked Data Orchestration, GigaOM Research*

The investment in terms of money, time, and skills is not trivial. Not every organization is willing or able to commit to it along with a long chain of actions before any actionable insight can be obtained. Thus, a gap is created between those that can benefit from BI solutions and those that can afford them. Even those able to implement a BI system are not getting the most out of their investment.

This is where disruption factors come into the picture. Today’s organizations need short implementation times, little or no upfront investment, and increased flexibility. These are precisely the reasons why cloud infrastructure and BI solutions are such a good match and complement each other’s strengths and capabilities.

**FIGURE 2: Agile BI: external to the organization, simple, instant access**



*Source: Linked Data Orchestration, GigaOM Research*

Cloud infrastructure is easily scalable and inexpensive, and its offerings can include tools and services to manage all the details of monitoring, backups, patching, and securing organizational data repositories. In practice, this means minimizing or completely removing the need for expensive hardware assessment, sizing, procurement, and maintenance operations and the dependence on the associated teams to perform these tasks. This is not to say that these tasks and teams are redundant per se but rather to emphasize that now everyone can enjoy the benefits that they bring without actually having the teams on hand and performing the tasks in-house.

BI solutions have evolved beyond the traditional data warehouse and associated multidimensional online analytical processing structures (cubes, star schemas, and so forth) in many significant ways. Beyond traditional relational databases, they can now integrate and analyze data from a number of sources.

- They have developed visual interfaces for query formulation, data exploration, and analysis in addition to traditional query languages.
- They incorporate rich and interactive visualizations in addition to traditional tabular reports and static charts.

- They support result dissemination via a number of channels (web, mobile, handhelds) in addition to traditional desktop applications.
- And they bear the promise of being operated by business people – not IT – and being implemented in days – not months.

The power and flexibility that the cloud adds to this equation creates a disruptive force in the BI domain. The future belongs to those vendors that adapt better and faster to this changing landscape and to those organizations that make the best choice of vendor – that is, the best fit – to benefit their operations.

# Evaluation methodology

We have highlighted why cloud capabilities are essential for any BI solution today and how, when they are coupled with other features, they act as a disruptive force in the BI landscape. We consider these five features as redefining elements for the BI market. In short, we call this new BI market “agile BI,” after the ability to implement BI the agile way – in incremental runs, without necessarily investing heavily upfront but rather on a pay-as-you-go approach.

**Table 1: Features to consider, weighted by importance**

Feature	Weighting	Reason
<b>Advanced visualization</b>	25%	Visualization capabilities and philosophy makes the difference between merely navigating and truly understanding big and complex data sets
<b>Data-source agility</b>	25%	Being able to integrate the widest possible range of data sets makes the difference between a fragmented and a holistic view
<b>Domain-specific knowledge</b>	20%	Solutions that distill domain knowledge lower the entry barrier for analysts, empower them, and make them more productive
<b>Cloud support</b>	15%	Cloud support does for BI solutions what it does for any other solution: It acts as a catalyst, enabling agile procurement, deployment, use, and scaling
<b>Distribution-channel agility</b>	15%	Because an ever-growing range of devices are claiming their share in user preferences, supporting as many of them as possible is important

The following sections include descriptions of these key disruption vectors and how we see them determining the winners and losers in the agile BI market over the coming months.

## Advanced visualization

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Beyond the use of traditional business graphics (bar graphs and pie charts, for example), the use of dynamic and interactive business graphics, such as real-time dashboards and interactive charts, can improve the ability for solutions to support users in increasingly demanding tasks. This is especially true for revealing insights not possible through conventional means in more complex and larger data sets.

Advanced visualization is different from static graphs and charts. Visual data navigation (being able to move across many dimensions in the data and zoom in or out at will) is a key feature when dealing with mass amounts of data and further complemented by the ability to automate part of this navigation via automated animation. This feature goes hand-in-hand with personalization, which is the ability to support user-defined views and actions, including conditional ones. Finally, the ability to support dynamic updates as the underlying data changes is a prerequisite in order to enable real-time analytics.

One vendor that excels in this area is Tableau. An ever-growing user base is employing its intuitive storytelling feature (notably via its free-for-all version) and making it the new spreadsheet. Another is Panorama, which has a one-click cause-and-effect visual analysis feature adding to its interactive charts.

## Data-source agility

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Long gone is the era of monolithic data warehouses and star schemas. Organizations today need to utilize data from various sources that come in all shapes and sizes: spreadsheets, server logs, ERP, CRM, social media, and idiosyncratic XML/web-service/custom-application data in addition to traditional relational data sources. The ability to import data seamlessly from as many sources as possible and to offer an integrated view over them without the need to define *a-priori* schemas offers flexibility and removes barriers in terms of what analyses are possible and what they can reveal.

Advanced functionality in this area entails finding possible data correlations and then suggesting or performing automated joins under the hood to offer an integrated view across data sets. Other features include:

- The ability to access and load data as quickly and easily as possible, potentially supported by an in-memory data store
- The choice to access data directly and store it in memory (or do both)

- Various data transformation and integration options

Leadership in this area is shared among Birst, MicroStrategy, SAP, and Tableau, as they are the companies offering the most options in terms of sources they support, ETL features, and ease of use.

## Domain-specific knowledge

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Agile BI solutions go far beyond traditional BI. These solutions are not just about infrastructure for data integration, reporting, and exploration; they are mostly about leveraging this infrastructure to provide value for organizations. The most prominent way to do this is by providing distilled industry-specific metrics and best practices embedded in their solutions. Sometimes this feature goes by the name of “embedded BI.” This is an overloaded term; for some, it means the ability to get data embedded in real-time, and for others, it means the ability to embed BI capabilities into their software.

What really makes a difference, however, is the extent to which domain knowledge is embedded in a BI solution, as this has the power to drive the business process and act as a multiplier for analyst efforts. This is what helps get the right data through the right flow at the right time to the right people. It’s all about knowing what to look for and how to interpret it. In addition to offering generic infrastructure for BI solutions and letting customers build the applications for their domain, some vendors are adding domain-specific solutions to their arsenal. Sales is the prime example of domain-specific knowledge distilled in agile BI solutions. The top industries and functions most likely to benefit from this include marketing, research and development, scientific-technical-engineering-mathematics (STEM), healthcare, financial services, retail, and insurance.

The vendor pioneering this feature is GoodData, as it is the only one that offers domain-specific applications (“bashes”) for sales, marketing, customer engagement, support, and churn.

## Cloud support

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The ability to democratize BI is key for solutions to reach their full potential and for vendors to maximize their market share. The most effective way to kick-start implementation is to utilize cloud-based solutions to empower business users so they can employ BI solutions with as little support from IT as possible and with as little intrusion as possible.

However, the cloud is not a panacea, and users should keep certain things in mind when evaluating the cloud-support aspect of agile BI solutions:

- a. Under certain circumstances, cloud solutions could end up costing more. The best way to evaluate the costs is to look at the vendor licensing, the people costs, the length of the project, and the overall total cost of ownership. After a certain point, cloud hosting can be less effective economically than on-premise, so ideally, vendors also should offer an option to install an on-premise version of the software under an appropriate license.
- b. Not all cloud-based solutions are created equally. Ideally, “the cloud” should not only mean storing data in the cloud but also removing the need to install and maintain client-side software. Everything should be browser-based. However, not all vendors prescribe to this recipe; some still rely on desktop clients to connect to their cloud-based infrastructure.

The leading vendors in this area are Birst and MicroStrategy, as they are the only ones that offer the combination of fully browser-based access to their cloud solutions as well as the option for an on-premise version of the solution.

## Distribution-channel agility

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The option to formulate queries, present results, carry out analysis, and disseminate results via a multitude of channels is an important factor in evaluating agile BI offerings. Mobile BI is gaining momentum as executives have a need for their mobile and tablet devices to access BI solutions on the go, but supporting mobile and tablet devices is not what channel agility is all about. In addition to supporting many distribution channels, most notably web and mobile/tablet, equally important is the extent to which channel capabilities are leveraged.

Typically, the web supports interaction via instrumented manipulation while mobile/tablet devices support visual manipulation. In instrumented manipulation, interaction with data and visualizations takes place via standard graphical user interface controls such as push buttons, radio buttons, checklists, pull-down menus, scroll bars, etc. Visual (or gestural) manipulation usually requires a touchscreen interface for manipulating visual objects with a mouse cursor by directly pointing, clicking, selecting, dragging, dropping, or lassoing. Visual/gestural manipulations that require a touchscreen interface or

multi-touch operations include pinch-and-zoom, rotate, and flick. This capability makes for a much more intuitive user experience, enabling easier query composition, result navigation, and drill-down.

There are two different approaches in this area, with some vendors like Birst, Panorama, and MicroStrategy currently leading the race for as many native application versions as possible, while others like QlikTech are adopting HTML5 and betting on its universal adoption in the mid- to long-term.

## Key takeaways

The BI landscape is rapidly reshaping under the influence of strong forces at work. We have outlined the nature of these forces. Our thesis is that we are in a transition era in which the emphasis is gradually shifting toward ease of use and ubiquitous access, less involvement from IT personnel, and more solution-embedded knowledge.

- The importance of advanced visualization has been paramount for a while, to the point that today solutions that do not make use of interactive and rich features are considered in the rearview mirror of BI. Over time, the same will hold for the rest of the disruptive trends we present here.
- Those vendors that combine innovation with reliability will drive the race for market share.
- We believe that eventually the key combination for making a difference in this new landscape will be cloud support and embedded domain knowledge. Coupled, these two features can open up the market to a previously unattainable audience, namely mid-sized businesses.

## About George Anadiotis

George Anadiotis has been in ICT since 1992, having worn many hats and juggled many balls. A ninja programmer, a lead architect, a team manager, and an entrepreneur, he has provided services to the likes of KLM and Vodafone, built and managed projects and teams of all sizes and shapes, and gotten himself involved in some award-winning research along the way.

The common thread that spans his activities is integration and modeling, be it on the application or the data level. He enjoys applying and evangelizing cutting-edge concepts and technology, was among the pioneers in big-scale application integration, and is among the pioneers in big-scale data integration.

Experience has taught that it takes both soft and hard skills to get things done, so besides problem-solving ability, analytical perspective, and can-do attitude, you have to add adaptability, teamwork, and communication to the mix. His latest trick is starting his own consulting firm and offering his services to organizations and individuals worldwide via the GigaOM Research network.

## About GigaOM Research

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