It’s Time To Upgrade Business Intelligence To Systems Of Insight
Supercharge BI With Agility, Big Data, And Insights To Drive Action

by Boris Evelson
July 20, 2015

Why Read This Report
Business intelligence (BI) has been faithfully serving enterprises for more than two decades. The world, however, doesn’t stand still. BI must keep evolving, improving, and adapting to key business agility trends in the age of the customer. Its next evolution? Systems of insight. This report connects the dots between our research on BI, Agile BI, and big data; proposes best practices for merging previously separate efforts into a more cohesive systems of insight strategy; and offers actionable advice for AD&D pros working on BI and big data initiatives on supercharging BI and upgrading to 21st-century systems of insight.

Key Takeaways

Earlier-Generation BI Approaches Are No Longer Enough
BI has served enterprises faithfully for two decades. Alas, its underlying architecture, mostly based on relational (SQL) and multidimensional (OLAP “cubes”) platforms, has many limitations, such as a lack of agility and scalability and constant misalignment between the business and technology professionals.

Top-Down And Bottom-Up BI Approaches Must Converge
Historically, BI best practices called for a bottom-up approach: Build an enterprise data warehouse and they will come. Recently, Agile BI has emphasized business requirements first, enabled by self-service BI for business users. It’s time to combine both into a new and winning approach -- systems of insight.

Start A New Chapter With Insights Teams And Digital Insights Architecture
Systems of insight are both a business discipline and a technology; they harness digital insights and consistently turn data into action. Multidisciplinary teams are key to this, using an insights-to-execution process and an extended architecture to embed insights in software, digital experiences, and everyday work.
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Notes & Resources
Forrester interviewed three user companies and four vendors for this report, including GoodData, Infor, MicroStrategy, and Oracle.

Related Research Documents
Boost Your Business Insights By Converging Big Data And BI
Build An Agile BI Organization
Digital Insights Are The New Currency Of Business
The Forrester Wave™: Agile Business Intelligence Platforms, Q3 2014
It’s Time For A User-Driven Enterprise BI Strategy
Earlier-Generation BI Needs A Tune-Up

Business intelligence has gone through multiple iterations in the past few decades (see Figure 1). While BI’s evolution has addressed some of the technology and process shortcomings of the earlier management information systems, application development and delivery (AD&D) teams still face challenges. Enterprises are transforming only 40% of their structured data and 31% of their unstructured data into information and insights.¹ In addition, 63% of organizations still use spreadsheet-based applications for more than half of their decisions.² Many earlier and current enterprise BI deployments:

› **Have hit the limits of scalability.** While modern SQL databases are designed for scalability, they impose significant overhead. It’s one thing to build indexes, aggregates, and bridging tables and use other techniques to tune database management systems (DBMSes) for millions of customer records and ERP transactions. But using the same techniques to optimize the storage and processing of trillions of Internet-of-Things events like mobile phone GPS data or to put unstructured text into a structured DBMS is, more often than not, prohibitively expensive, despite being theoretically possible.

› **Struggle to address rapid changes in customer and regulatory requirements.** BI started in the 1970s with the use of NoSQL DBMS technologies to store transactions and produce simple tabular reports; it upgraded to SQL in the 1980s to standardize data access and provide consistency, accuracy, and referential integrity. SQL-based DBMSes are great for what they were designed for — analyzing structured data from ERP and CRM data sources, which required changes on a monthly basis at most. But today, constantly shifting customer behavior and data sources with little to no structure demand a different type of technology and data architecture.

› **Fail to break through waterfall’s design limitations.** Data exploration and discovery were not traditional strengths of earlier BI tools. In the simpler world of the 1980s when BI largely involved financial data, AD&D pros working on BI assumed that all of their possible questions (and all of the possible answers) could be embedded in an all-encompassing enterprise financial data warehouse. In the modern, more complex world, they’ve learned the hard way that big data has patterns and insights that are hidden until they look at the data.

› **Suffer from mismatched business and technology priorities and languages.** Business leaders in areas like marketing, sales, and customer service know that their customers cannot and will not wait. AD&D pros often try to support their urgent requirements but face difficulties in balancing opposing priorities, such as standardizing BI tools and data or managing security and operational risk. Adding insult to injury, business and technology pros speak different languages, which slows down initiatives. AD&D pros designing BI applications use terms like multidimensional data modeling, slowly changing dimensions, and unbalanced and ragged hierarchies, while their business peers just want to understand why their sales dropped this quarter.
Agile BI And Big Data Deliver Parts Of The Solution

AD&D pros have not been resting on their laurels. Over the past few years, they have started to embrace and deploy multiple new approaches and technologies to address the limitations of earlier BI environments. Two of the most recent technology and process enhancements to BI have the potential to offer great value, but they still come up short if AD&D pros pursue them as two separate paths.³

› Agile BI addresses the fast pace of change by empowering business users. Agile BI software development methodologies, flexible BI organizational structures and processes, and modern and elastic BI technologies (including in-memory, cloud, mobile, and predictive analytics) can
dramatically increase the business impact of BI. By following Forrester’s Agile BI best practices, one global fashion online retailer reported a 25% to 68% increase in BI adoption by business users, a 27% reduction in the number of tech staff previously supporting BI, and a 25% increase in new BI functionality based on monitoring business users’ usage of BI. Unfortunately, most Agile BI initiatives aren’t connected to big data initiatives; different projects and constituents often deploy and use them. The result: Enterprises fail to tap up to 60% of structured data and up to 69% of unstructured data for decisions and insight.

Big data expands the 360-degree view of customers. AD&D pros must leverage big data technologies like NoSQL to tap more data sources, including unstructured data like social media, as well as the orders of magnitude more data coming from the Internet of Things. Those who master big data can achieve tremendous results. One telco used Teradata SQL-MapReduce functionality to mine cell phone locations and point-of-sale patterns to build “720-degree” views of its customers that predict social relationships and how they influence buying behavior. However, most big data architectures and platforms still fall in the realm of technology and data science professionals, leaving business users highly dependent on expensive technical resources.

Systems Of Insight Come To The Rescue

Earlier this year, Forrester introduced the concept of systems of insight, which sits alongside systems of record, systems of automation, and systems of engagement. We define systems of insight as:

The business discipline and technology to harness insights and consistently turn data into action.

Forrester sees these systems of insight as the natural evolution of BI, as it involves applying all of the BI best practices that AD&D professionals have accumulated in the past two decades. While systems of insight require a significant strategic shift — including moving from IT to business technology (BT), embracing the priorities of the age of the customer, and emphasizing business agility — the payback can be tremendous. Online retailer Stitch Fix built a system of insight that allows it to turn customer preferences into insights that drive sales — sales that some of its execs project will surpass $200 million this year, after just four years in business and with very little traditional paid marketing. AD&D pros can help their firms further close the gaps between earlier BI and systems of insight by (see Figure 2):

Using a single architecture to push Agile BI and big data convergence. Agile BI and big data are two admirable evolutionary paths — but they must ultimately converge and evolve into systems of insight. As one of your first steps on the path to convergence, deploy BI and big data applications using a hub-and-spoke data architecture. This flexible reference architecture puts a Hadoop-based data hub at the center of the enterprise information architecture; enterprise and departmental BI applications then form spokes off the Hadoop-based data hub.
Forrester clients often use commercial Hadoop distributions from Cloudera, Hortonworks, or MapR as a platform for their data hubs. They can then explore and analyze data on demand and in an agile manner using tools — either ad hoc tools or departmental BI “spokes” — from the likes of Attivio, Datameer, Oracle (Big Data Discovery), Platfora, and Splunk. For more structured analysis, clients use these data hubs as staging areas and for preprocessing; they then create an enterprise BI “spoke” by leveraging their existing ETL, DBMS, and BI tools.

› Making BI contextual and actionable. Make BI pervasive by embedding it into ERP, CRM, and other transactional applications; for example, you can display supplier inventory levels, current prices, and delivery times right inside the inventory analysis dashboard. Similarly, integrate BI and ERP/CRM metadata so that even standalone BI applications can carry context from and to transactional applications. Next, leverage embedded BI and/or integrated metadata to “write back” — i.e., to add, update, or delete transactions, such as submitting a purchase order. Last, integrate BI with business process management and business rules engine (BRE) platforms to execute long-running asynchronous events, such as getting multiple sign-offs for a large transaction.

Most modern BI platforms have rich APIs that enable integration with transactional applications. AD&D pros working with Oracle applications can also leverage common enterprise information metadata (CEIM) to create actionable BI applications. They can achieve the same objectives using Infor ERP, as it automatically replicates each ERP transaction to its data warehouse (Infor ION Business Vault); in turn, this can enable its BI platform to write back to ERP applications. SAP has made an even more significant leap in integration by eliminating the need for different database platforms and/or instances — SAP Hana enables analytics directly on transactional data.

› Tapping collective intelligence from all enterprise knowledge workers. The term “tribal knowledge” — where insights from an organization’s subject matter experts form the basis for most business decisions — often has negative connotations. But as BI usage metadata already stores such knowledge, why shouldn’t you use this collective intelligence in a more automated way? By analyzing BI usage metadata, a platform can suggest the best data sources to answer a question, such as why revenues are declining; the best metric to use when analyzing the cause and effect of declining revenues, such as customer profitability or margins; the best data visualization for analyzing a particular data set, such as a bar chart, pie chart, or scatter plot; and the next steps to take in the analysis, such as drilling down by time period, region, customer, or product.

Cloud software-as-a-service BI vendor GoodData takes collective intelligence to the next level by mining BI usage metadata across all of its cloud applications and all of its clients, not just within a single client instance. Its “insights as a service” engine understands the context of your problem and generates the most likely path to the next insight, based on the collective intelligence developed from millions of GoodData community interactions. As it uses just the usage metadata, rather than the actual data, during the mining process, no proprietary client information is ever revealed to the users benefiting from this guided analysis.
› **Leveraging “BI on BI” for continuous improvement.** Forrester’s latest research on systems of insight offers best practices for deploying continuous feedback mechanisms to improve business insights. But what about managing the effectiveness of the BI environment itself? AD&D pros still rely largely on intuition and subjective assessments of business users’ level of satisfaction with BI applications and tools. Those working on BI and big data initiatives should mine data warehouse and data mart database logs as well as BI usage metadata to understand usage patterns and then optimize and streamline their BI platforms, tools, and applications.\(^\text{11}\)

In the past, AD&D pros had to rely on individual BI platforms and DBMS logs and metadata as well as undertake largely manual integration to monitor and optimize BI efficiency and effectiveness. Help is on the way. Startup Alation can automatically crawl all of an enterprise’s data sources and index not only the database catalogs but also all of the queries and users. Clients can then use the resulting automatically generated business data dictionary and interface catalog as an off-the-shelf “BI on BI” platform.

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**FIGURE 2 Agile BI And Big Data Enable Systems Of Insight To Democratize Data**

- **Agile BI**
- **Data democratization**
- **Earlier-generation BI and analytics**
- **Big data**

- **Systems of insight**

**Business agility**

**Amount and availability of data**

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Recommendations

Focusing On The Customer Is Key To Systems Of Insight Success

The world of BI is riddled with strained relationships and misaligned business and technology teams. AD&D pros often focus too heavily on driving consistency with their enterprise’s standard tools and approved data set by deploying enterprise data warehouses. While this is a noble endeavor, customers may be long gone by the time “the right application” is in use. Rather than blaming each other, AD&D pros and business leaders should renew their joint focus on the end customer. AD&D pros can help by:

› **Encouraging their business peers to own systems of insight.** Systems of insight leaders like Netflix and Stitch Fix don’t bury BI, analytics, and big data in technology cost centers; they embed these initiatives and budgets in revenue-generating departments. C-level business executives, such as the CMO, COO, and CFO, become the owners of systems of insight; in terms of the well-known RASCI model, they are responsible and accountable for systems of insight, while the CIO’s role is to support and empower them.¹²

› **Shifting their priorities from building reports to enabling digital insights architecture.** In the systems of insight world, AD&D pros are no longer responsible for building reports and dashboards, other than the most complex and mission-critical ones. Instead, they empower their business peers with self-service tools, platforms, and applications, enabling them to tackle the majority of their BI requirements and get their own insights.

› **Helping BI centers of excellence evolve into insights teams.** Challenge your business peers to put their money where their mouth is and get their own insights!¹³ They must stop blaming technology for all of their BI challenges; emerge from the darkness of shadow IT; and join the party at the BI centers of excellence and competency centers.¹⁴ Don’t just use business data and BI knowledge behind closed doors in a private office; the rest of the enterprise can benefit from their years of experience and expertise.
Supplemental Material

Survey Methodology

For its Global Business Technographics® Data And Analytics Survey, 2015, Forrester conducted an online survey fielded in January through March 2015 of 3,005 business and technology decision-makers located in Australia, Brazil, Canada, China, France, Germany, India, New Zealand, the UK, and the US from companies with 100 or more employees.

Forrester’s Business Technographics Global Data And Analytics Survey, 2014, was fielded to 1,658 business and technology decision-makers located in Australia, Brazil, Canada, China, France, Germany, India, New Zealand, the UK, and the US from SMB and enterprise companies with 100 or more employees. This survey is part of Forrester’s Business Technographics and was fielded from January 2014 to March 2014. ResearchNow fielded this survey on behalf of Forrester. Survey respondent incentives include points redeemable for gift certificates. We have provided exact sample sizes in this report on a question-by-question basis.

Forrester’s Business Technographics provides demand-side insight into the priorities, investments, and customer journeys of business and technology decision-makers and the workforce across the globe.
Forrester collects data insights from qualified respondents in 10 countries spanning the Americas, Europe, and Asia. Business Technographics uses only superior data sources and advanced data-cleaning techniques to ensure the highest data quality.

**Companies Interviewed For This Report**

- GoodData
- MicroStrategy
- Infor
- Oracle

**Endnotes**

1. These are estimates based on ranges and are not exact. Source: Forrester’s Global Business Technographics Data And Analytics survey, 2015.

2. Sixty-three percent of data and analytics business decision-makers indicated that 50% or more of the BI applications they use are homegrown. Source: Forrester’s Business Technographics Global Data And Analytics survey, 2014.

3. Should organizations manage BI and big data platforms and applications together or separately? In this report, Forrester recommends that AD&D professionals working on BI and big data initiatives get the best out of both by designing and integrating them in a flexible data platform. This report proposes such a flexible platform, describes components and use cases, and provides recommendations on how to get started and the pitfalls to avoid. See the “Boost Your Business Insights By Converging Big Data And BI” Forrester report.

Ubiquitous digitization brings a host of new data sources and data types, such as data from mobile devices, the Internet of Things (IoT) sensor data, and newly digitized business processes. Empowered customers demand more information than ever before, and your firm needs insights — delivered on a regular basis — to meet their needs. Enterprise architects need an architecture vision that unifies data from databases, server logs, device streams, and electronic records into the information your customers demand and the insight your employees need. This report provides new principles you should use to found modern information architecture. See the “Brief: The BT Agenda Demands New Information Architecture Principles” Forrester report.

4. Even after doing their best for over 20 years to build centralized, scalable information architecture, Forrester surveys always find that only a small percentage of organizations’ data is actually converted to useful information in time to leverage it for better insight and decisions. At both strategic and tactical levels, much of this quagmire can be explained by the fundamental disconnect in goals, objectives, priorities, and methods between technology management professionals and the business users they should ideally serve. This report helps AD&D pros deconstruct the inherent conflict between roles to reach a clear understanding of why the business and technology management BI relationship is broken. See the “It’s Time For A User-Driven Enterprise BI Strategy” Forrester report.

5. These are estimates based on ranges and are not exact. Source: Forrester’s Global Business Technographics Data And Analytics survey, 2015.

6. In 2015, big data buzz will settle as technology management and businesses seriously invest in this technology and discover what works and what doesn’t. But big changes are brewing underneath the smoothing surface that enterprise architects and vendor strategists must understand and prepare to navigate. This report builds on a number of the big data predictions reports published in late 2014 and provides a top-level view of what is going to happen in 2015 as firms seek to turn big data into business insight. See the “Brief: Turning Big Data Into Business Insights, 2015” Forrester report.
The old 360-degree view of the customer is too small. Add in a customer's circle of social relationships and influencers — a so-called 720-degree view — and expand from there to include sensor data, streaming real-time data, acquired data, B2B relationships . . . anything. For more information on this concept, see the “A Radical Rethink Of Data Architecture For Customer Engagement” Forrester report and see the “The Big Deal About Big Data For Customer Engagement” Forrester report.

Forrester first introduced this concept in April 2015. See the “Digital Insights Are the New Currency Of Business” Forrester report.

Should organizations manage BI and big data platforms and applications together or separately? In this report, Forrester recommends that AD&D professionals working on BI and big data initiatives get the best out of both by designing and integrating them in a flexible data platform. This report proposes such a flexible platform, describes components and use cases, and provides recommendations on how to get started and pitfalls to avoid. See the “Boost Your Business Insights By Converging Big Data And BI” Forrester report.

In Forrester’s 60-criteria evaluation of enterprise business intelligence (BI) platform vendors, we identified the 11 most significant software providers and researched, analyzed, and scored their current market offerings. This report details our findings about how well each vendor fulfills Forrester’s evaluation criteria and where they stand in relation to each other to help AD&D professionals select the right vendor for their enterprise BI platform. See the “The Forrester Wave™: Enterprise Business Intelligence Platforms, Q1 2015” Forrester report.

For more information on leveraging BI on BI, see the “BI on BI: How To Manage The Performance Of BI Initiatives” Forrester report.

The RASCI matrix assigns and clarifies roles and responsibilities by showing who is responsible, accountable, supporting, consulted, and informed.

In Forrester’s 15-criteria evaluation of Agile business intelligence (BI) vendors, we identified the 16 most significant software providers in the category and researched, analyzed, and scored them. This report details our findings about how well each vendor fulfills our criteria and where they stand in relation to each other to help AD&D professionals select the right platform for their Agile BI requirements. See the “The Forrester Wave™: Agile Business Intelligence Platforms, Q3 2014” Forrester report.

Earlier business intelligence (BI) support centers — organized along the same lines as tech support centers for all other enterprise software — fall short when it comes to BI’s peculiarities. These unique BI requirements include less reliance on project planning and the traditional software development life cycle and more emphasis on reacting to the constant change of business requirements. This report provides an organizational framework that describes how AD&D professionals working on BI initiatives can align their BI organization for agility; it’s a key part of Forrester’s Agile BI research — Agile BI software development, organizations, processes, and technologies. See the “Build An Agile BI Organization” Forrester report.
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