Ten Characteristics of a Modern Analytics Platform
Next-Generation Business Intelligence

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About the Author

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Eckerson Group is a research and consulting firm of veteran practitioners who help business analytics leaders use data and technology to drive better insights and actions. The group’s researchers and consultants each have more than 20 years of experience in the field and are uniquely qualified to help business and technical leaders optimize their investments in business intelligence, analytics, big data management, and the Internet of things.

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From Old to New

**Evolution.** Business intelligence (BI) vendors first shipped BI tools in the early 1990s. At the time, the tools were purpose-built to support a single mode of BI, such as production reporting, ad hoc query and reporting, online analytical processing (OLAP), and dashboards. In the 2000s, vendors built or bought purpose-built BI tools and packaged them into BI suites. The tools still featured mostly distinct graphical interfaces and engines, but at least customers could now get every BI tool from a single vendor.

Fast-forward to today: BI vendors are shipping so-called “modern analytics platforms.” These are open, extensible analytical environments that support all modes of BI and run on a single, integrated, metadata-driven architecture. Some vendors, such as MicroStrategy—the sponsor of this report—have always offered integrated BI environments; most have now updated self-service, data preparation, and other modern features.

**Revolution.** The rise of modern analytics platforms is partly driven by extraordinary gains in the price/performance of hardware (e.g., CPUs, memory, disk, and networks), which has created a wave of innovation that is driving wedges into traditional software markets such as BI and analytics. Today, vendors need to ship products that support:

1. New deployment platforms (e.g., Web, cloud, mobile, and streaming).
2. Big data management platforms (e.g., relational, Hadoop, Spark, in-memory, cloud).
3. Various types of data, applications, and systems (e.g., structured, semi-structured, search, ERP/CRM, NoSQL, JSON, file systems, and data syndication services).
4. New flexible and transparent pricing models that support “try before you buy” and provide exceptional price/performance value.

Few vendors have the resources and vision to support all these new requirements or to rearchitect existing products into a modern analytics platform. Only the most far-sighted, innovative, and nimble BI and analytics players will survive in the coming years as customers become accustomed to working with modern platforms in all sectors of their personal and professional lives.

**Outline.** This report describes the 10 most salient features of a modern analytics platform. The list is not exhaustive, but it provides business and BI managers a good sense of what to look for in a new or existing BI and analytics product. It is designed to jump-start discussions with prospective vendors about their product road maps and capabilities.
Ten Characteristics

1. Support All Modes of BI and Users

All Modes. A modern analytics platform is a mature BI environment that supports every type of BI—from production reporting, dashboards, and scorecards to OLAP, ad hoc reporting, visual discovery, alerting, collaboration, and prediction. Each mode runs on the same hardware and software architecture, utilizes the same services and engines, and sports a common graphical interface that makes it easy for users to learn and use all the functionality in the product.

Moreover, the BI modes are functionally integrated. For example, users can turn an ad hoc query or OLAP analysis into a production-caliber dashboard or report. They can drill from a report or dashboard into an OLAP grid or chart with drill-anywhere and other interactive features. Likewise, report authors can incorporate predictive models into reports, dashboards, and OLAP applications.

All Users. With a comprehensive set of BI functionality, a modern analytics platform supports all types of users. Data consumers use interactive reports and dashboards with built-in features to drill, sort, pivot, and visualize if desired. Data explorers edit those documents, adding new metrics, dimensions, and hierarchies, which they can share with others (if permitted) or export to a desktop productivity tool (if allowed). Data analysts can query various data sources, mash up the data, and visualize and share the results. Finally, data scientists can import predictive models into the platform, embed them within queries and reports, and generate scores for each record to assist with decision making.

2. Deploy Natively Anywhere

To qualify as a modern analytics platform, BI products need to support “modern” platforms—specifically the Web, cloud, and mobile. Authors should be able to create a report or dashboard once and deploy it on any platform without additional coding or configuration. To make this possible, BI vendors need to design or rearchitect their products to run natively on all platforms without clumsy workarounds. “Design first” for the Web, mobile, and cloud (among other things) is becoming a common mantra among software vendors. (See “Ten ‘Design First’ Principles from Strata/Hadoop World NYC”.)

Web Processing. The Web has been around for almost two decades, but only in the last several years have Web-based applications begun to match the functionality and performance of desktop and “fat-client” applications. For BI products, this means that a Web browser becomes the de facto client for business users, developers, and administrators. They should be able to access the same functionality with the same speed and responsiveness as they can with a desktop tool, as well as continue working while disconnected from the Internet.
Mobile Delivery. Smartphones and tablets have become ubiquitous, and for many working professionals, they are the dominant device for analyzing corporate data. Consequently, a modern analytics platform must provide seamless support for mobile devices, including offline access and transactions. Reports, dashboards, and discovery environments must work equally well on small-form factor devices as on large ones. Authors should see how their report or dashboard displays on various devices during development, and at run time, BI applications should have responsive displays that dynamically adjust to the screen size of the device.

Cloud. Modern analytics platforms run natively on private or public clouds and work seamlessly with on-premises applications. That means cloud BI users can query on-premises data sources via a secure virtual private network, and on-premises BI users can publish reports to a cloud-based BI server or portal. In addition, administrators can offload BI processing during peak times to a cloud-based counterpart.

A modern analytics platform also supports multiple tenants in a single, centralized, cloud-based deployment. Each tenant gets its own virtual version of the analytics platform, which it can extend and configure to meet local requirements. Administrators can update BI objects and capabilities in the master copy and propagate changes to each tenant, keeping everyone in sync and avoiding expensive software upgrades.

3. Support Analysts with Data Discovery

For years, data analysts found BI tools woefully lacking. At best, they’d use the products as glorified extraction tools, downloading data into a spreadsheet or local database where they would mash up the data and conduct their analysis. But that’s changed in the past five years as vendors have shipped tools for data discovery, data preparation, and data cataloging that liberate data analysts from having to use the combination of Microsoft Excel and Access as an analytic workbench.

This new triumvirate of self-service tools enables data analysts to find, connect, combine, transform, analyze, and visualize data and share the results. The tools provide built-in recommendations that automate routine tasks such as finding relevant data, profiling and cleaning data, selecting chart types, identifying data types, joining tables and data sets, and creating data models. This accelerates adoption and makes it easy for new data analysts to become productive quickly.

4. Support Governed Self-Service

The downside of self-service analytics is that some business users use the tools to create a plethora of similar or conflicting reports, spawning “report chaos” and causing users to distrust all reports except the ones they create. Modern analytics platforms balance the need for self-service with the need for governance. They give data analysts the freedom to generate insights quickly using standard and non-standard data sets, while giving the IT department and governance teams the ability to maintain standards for enterprise reports and data.
BI products walk this fine line by providing administrators with granular control over the features, functions, and data that users access. Each business user gets the BI functionality and data he or she needs, and nothing more (until they need more). In other words, modern analytics platforms gracefully evolve to meet business user requirements. The best platforms also incorporate a curation workflow that enables data analysts to promote their work to a central governance committee for review. If the committee approves the content (either as-is or after additional development work), they affix a watermark or seal on the content, indicating that its metrics and data have been vetted. (See figure 1.)

5. Integrated Architecture and Services

Governed data discovery isn’t really possible unless all business users are running on the same platform. But that means the platform must scale to support the entire enterprise—with hundreds of reports, thousands of users, and potentially tens of thousands of concurrent queries. A modern analytics platform is the antithesis of a BI silo, where each department has its own BI implementation that often includes tools from different vendors.

A scalable analytics platform is metadata driven. That means once administrators set up a BI environment, they can update any object in the system (e.g., metric, attribute, filter, prompt, security badge, group, report, chart, grid, form, cube, template) and automatically propagate the changes everywhere. A scalable analytics platform is also efficient; that is, it uses a common set of services and engines to execute all tasks and operations. These services can be deployed across a clustered hardware environment with load balancing to optimize performance and scalability.
6. Connect to Any Data

Another hallmark of a modern analytics platform is that it can connect to any data source and process any type of data, from structured to semi-structured and unstructured. In the past, most BI tools could query only relational databases. Modern analytics platforms acknowledge the diversity in the modern computing environment. They provide native connectors to relational, OLAP, in-memory, Big Data (e.g. Hadoop), and NoSQL data sources. They also provide native support for the ever-growing list of cloud applications, such as Salesforce.com, and social media applications, including Twitter and Facebook. They can parse semi-structured data formats, such as JSON, instead of querying them as binary large objects or relying solely on a database or transformation tool to perform these tasks. The best platforms can query multiple data sources at the same time, resolving joins on the fly, and using push-down data processing to optimize performance.

7. Balance Scalability and Performance

Historically, BI tools either favor scalability or performance. Scalable tools connect directly to big data sources and applications and rely on the power of the database, SQL sleight of hand, and native drivers to resolve complex queries on the fly. Although these tools allow business users to query all the data, performance traditionally suffers.

In contrast, BI tools that favor performance extract data, model it, and store it in a local high-performance database, either in memory or on disk. These tools usually preaggregate data along common dimensions and query paths, ensuring consistently fast response times to common queries. On the downside, the tools provide only summary views of data. To compensate, most provide a “drill-through” capability to data in the source database, but these connections are typically hand-crafted, brittle, and slow.

Modern analytics platforms optimize both performance and scalability. Scalability-oriented tools use native drivers, caches, and query projections to improve response times. Performance-oriented tools use scale-out or scale-up platforms to place more data in memory or on disk, as well as drill-through interfaces and linked aggregate databases to increase scalability.

8. Extensible and Open

A modern analytics platform wouldn’t qualify as a “platform” if it didn’t run other applications. Rich application programming interfaces (APIs) make it easy for developers to connect other applications to the platform. For instance, they can use the API to query the platform’s internal database, semantic model, or reports. At a deeper level, they might write code that uses the platform’s query engine or its charting, broadcasting, or visualization engines. This enables them to create custom analytic applications or embed BI functionality inside a host application.
Modern analytics platforms also provide software development kits (SDKs) and APIs that enable developers to extend the platform’s existing functionality. For instance, they might create new data connectors, visualizations, analytic functions, and administrative utilities or import third-party components so they appear in the platform’s object library.

Through openness and extensibility, a modern analytics platform becomes much richer and more valuable to customers. Astute BI vendors create marketplaces where developers can publish (and sometimes sell) extensions and integrations and software vendors can publish add-on applications. These developer communities expand the functionality of an analytics platform beyond what a host vendor could develop or imagine on its own and APIs that enable developers to extend the platform’s existing functionality. For instance, they might create new data connectors, custom visualizations, analytic functions, administrative utilities, custom web and mobile applications, embed data in portals, or create white-labeled applications.

9. Collaboration and Storytelling

Modern analytics platforms incorporate rich collaboration features. These include (1) sharing live reports and visualizations via email and chat, (2) annotating reports, charts, and cells with text, images, and threaded discussions, and (3) spawning content-driven workflows where users discuss results, assign tasks, and monitor progress.

A big part of collaboration is sharing results. Most BI users simply copy and paste charts and tables into PowerPoint slides that they present to executives and managers. Modern analytics platforms co-opt and improve this process. Modern analytics platforms make it easy for report authors to build data-driven narratives using visualizations. These can be locked down (in a view only mode), or opened, to encourage greater user interactivity and data exploration.

10. Progressive Pricing

Finally, modern analytics platforms adopt modern pricing strategies. These range from simplifying and publishing pricing on Web sites to offering free trials, free software, or freemium versions so users can try the software in a production setting before making a purchase.

Modern pricing is also flexible—customers can purchase an on-premises license or a subscription, with options for monthly or annual payments. Products are sold natively on public cloud platforms, with annual, monthly, or even hourly subscriptions brokered by the cloud provider. Finally, value-based pricing aligns with common use cases—including named user, per server, or concurrent user licensing—without introducing additional options that add unnecessary complexity.
Time for a Change

Many organizations have been using the same BI tools for years, if not decades. Most are reluctant to change because the switch-out costs are huge—they would need to retrain developers and users, install and reconfigure the BI environment, and migrate or rewrite reports.

Yet, technology keeps evolving, making traditional tools obsolete. To stay current, BI vendors need to periodically rearchitect their products to keep up with customer demands for faster, better, cheaper tools. Question your vendor about its road map. Determine whether it is content to milk its installed base with older technology, or if it wants to innovate and offer a truly modern analytics platform that will that will support your organization’s future needs.

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