

Transform your business with data and analytics

*Make big data and analytics a central force for business growth,
expansion, competitive advantage and transformation*



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Analyzing new and diverse digital data streams can reveal new sources of economic value, provide fresh insights into customer and market trends, or optimize operations to reduce cost and increase productivity. No matter what industry you're in, those results can translate into tangible benefits for your business.

But reaping the benefits of big data and analytics requires broad, strategic thinking and planning, followed by deliberate actions that maintain forward momentum. You need the right capabilities to capture and organize a wide variety of data types from any source, and then quickly analyze that data within the context of your unique business imperative. For analytics-driven insights to trigger new actions across the organization, they must be closely linked to business strategy and easy for business users to engage with and understand. They must also be embedded into organizational processes so knowledge workers—and even the systems themselves—can take the best action at the right time.

Does your business have a big data and analytics strategy to make this happen—now and in the future? How are you responding to the pressure to deliver value incrementally while mitigating disruption? Is your data still playing a limited, traditional role at the edges of individual departments? What's the organizational appetite to transform the way you work?

Leaders are 166 percent more likely to make most decisions based on data, while 75 percent of leaders cite growth as the key source of value from analytics.

Source: "Analytics: A blueprint for value—Converting big data and analytics insights into results." IBM Institute for Business Value. 2013.

Now is the time to move big data and analytics to the center of your business. When big data and analytics become the logical engine that drives decisions, fuels interactions and engagement, and powers processes and systems of record, everyone (and every system) gains the insights necessary to respond to business demands with decisive action (see Figure 1).

Begin with the end in mind

Every journey starts with a plan. You wouldn't start a car trip simply by getting behind the wheel and driving; you have a destination in mind. You've thought about how you'll get there, what route you'll take and when you want to arrive. You may encounter detours or take side trips along the way. But your destination is clear.

The same is true for a big data and analytics journey. New technologies and systems, both within and outside the enterprise, collect more data than ever before. Yet many organizations aren't sure how to use more than a small segment of their available data to generate potential advantages. Knowing what happened and why it happened is no longer adequate. You need to know what is happening now, what is likely to happen next and what actions to take for optimal results.

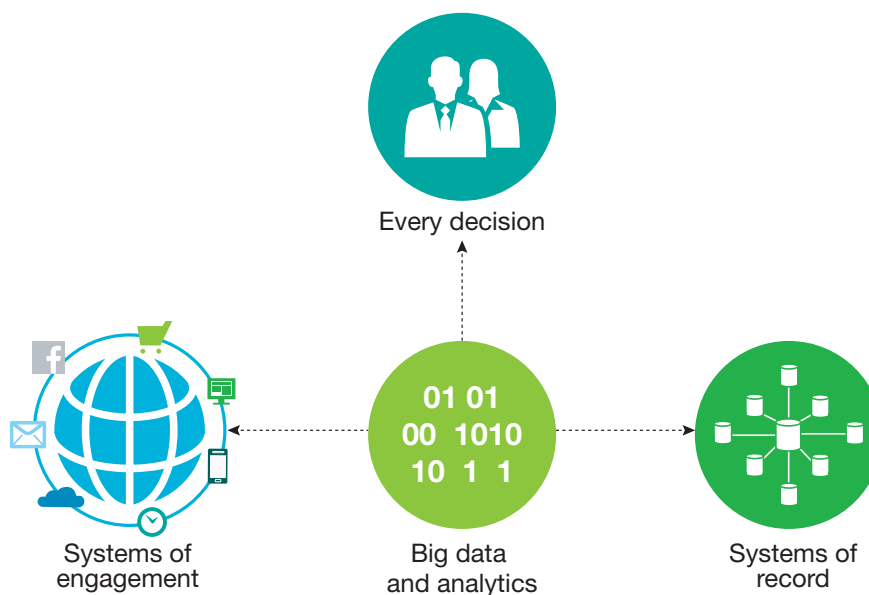


Figure 1. To maximize the value of all data, make big data and analytics the central engine for your business.

Ideally, you will articulate these plans in terms of business value. Some organizations need assistance framing the big picture and selling that agenda internally, and turn to expert advisors to guide them on their path.

Achieving this level of insight requires deeper analytics applied to a broader spectrum of data. Quite simply, if you want to become an industry leader, you must embrace big data and analytics as a catalyst for change and growth—and articulate your overarching strategy to achieve that goal.

The five-step progression identified by IBM helps you gain that knowledge by starting simply, possibly with a single use case, and then applying the lessons learned to more (and more intensive) initiatives across the business. Along the way, the questions that emerge will help you adjust processes, approaches and strategies to build a truly data-driven culture (see Figure 2).



Figure 2. Transforming your business with big data and analytics isn't a one-time event—it's an ongoing journey with a series of steps, each one setting the stage for the next.

Introducing the chief data officer: Leader of the big data and analytics pack

Articulation of (and agreement to) a big data and analytics strategy is ideally done up front. In many firms, however, it evolves as the organization matures in its use of data and analytics. Increasingly, a leadership team—often headed by a chief data officer (CDO)—crafts the strategy to reflect the overall business goals and works closely with other C-level executives to bring this vision to life.

The CDO plays a critical role in guiding and leading an organization's transformation journey. No matter where you are in your journey, establish this position and give the CDO the mandate to innovate as soon as possible.

For some organizations, an expert guide (such as a consultant) is essential to get started in the right direction. Often, these external consultants can help organizations envision what's possible, understand the impacts of possible scenarios and articulate a strategy that incorporates buy-in from all parts of the enterprise.

Once your strategy is in place, the next challenge is successfully executing against it. Whether you are at the start of your journey or well on your way, the five-step big data and analytics transformation model can help propel your organization forward.

Step 1: Identify high-value opportunities

As with most improvement initiatives, the ideal place to start incorporating big data and analytics is the area of the business with the greatest potential for positive impact: a high-value opportunity. This approach allows you to make that impact quickly, even when many of the systems, components and data sources are new, possibly immature, and require investigation and practice to deliver the best outcomes. It's also a possibility that you want to engage with external experts to help build a business case and financial rationale for pursuing specific opportunities.

The sheer volume of data and options can be overwhelming—and distracting if team members get too enamored with the technology. This is where a technology blueprint can help you define the scope of big data and analytics within the organization by identifying the key business challenges to which it will be applied.

The blueprint creates a common understanding of how you intend to use big data and analytics to improve your business and meet your defined objectives. It also takes into consideration existing data, technology and skills, and outlines where to start and how to develop a plan that aligns with your business strategy.

Select use cases with high business impact

Identifying top business imperatives (such as those in Figure 3) helps you focus and justify your efforts. The high-level imperatives can be broken down into supporting elements or processes, each of which may have multiple use cases that would benefit from the power of big data and analytics.

For instance, a business imperative of “optimize operations” may require improving infrastructure and asset efficiency. To do that, you may need to collect more information about field equipment and age; improve access to documents about plant safety, environmental reports and failure logs; develop a system to track maintenance activities and providers; and so on. Each of those represents a use case that could benefit from big data and analytics.

The following examples represent a cross-section of industry use cases where big data and analytics can deliver measurable results.

Create highly targeted marketing campaigns in consumer products

Micro-market campaigns target specific individuals or groups of consumers to improve the outcomes of marketing programs and create better customer relationships. Big data and analytics systems enable consumer products companies to capture and analyze high-velocity Internet data such as tweets, Facebook postings and blog commentary, and modify campaigns on the fly based on what they learn about consumer sentiment. The ability to quickly access and leverage this information allows companies to spend less money on certain areas of marketing while still getting the intended—or better—results.



Figure 3. Identifying business imperatives is a natural starting point for big data and analytics projects.

Detect and investigate fraud in financial services

Fighting fraud, financial crimes and security breaches is one of the most costly challenges facing the finance industry. Credit card transactions, account opening processes, customer-service notifications, funding transfers, forgotten password requests and stock trades: all of these and more represent opportunities for fraud. Big data and analytics technologies provide a scalable, integrated, secure and cost-effective platform that can help prevent, detect and mitigate internal and external fraud attempts.

Forecast real-time demand in retail

Accurately projecting demand and closely managing inventory levels can significantly reduce inventory costs and increase profitability for retailers. During promotions, companies can gather real-time shipment and point-of-sale pricing information to ensure stores that have committed to running a sales promotion are actually participating. If stores have not implemented a promotion, field sales personnel or retail store managers can be contacted to fix the problem, which will help improve the overall profitability of a promotion.

Developing innovative uses for new data in transportation

Publicly available information—weather data, economic forecasts, housing density, crime reports and so on—can be used to enrich predictive models in many industries. For example, transportation companies could use big data and analytics to more accurately incorporate weather forecasts as a factor in their route-planning processes. By analyzing weather reports, they can improve route efficiency and safety: routing trucks around areas under flood warnings, telling drivers to pull over and wait for tornado warnings to pass, or choosing alternate transport methods if heavy snowfall is predicted around a major hub.

Succeeding with big data and analytics: Four things you must get right

1. **Instill a sense of purpose in these activities. Establish a business-driven agenda that enables executive ownership, aligns to enterprise strategy and business goals, and defines new business capabilities. Without this alignment, transformation may fail or be less than optimal.**
 2. **Architect for the future. Be proactive about privacy, security and governance. To minimize potential risk to your reputation, systems and information, ensure that the data being analyzed is safe, secure and accurate.**
 3. **Invest in big data and analytics capabilities that are tuned to the task of handling data and analytics regardless of type, format, source or function, and expand that platform as needed to accommodate more use cases. Leverage what you have, and then add more if and when you need it.**
 4. **Enable the organization to act. Build a culture that infuses analytics everywhere. Instill a curiosity-driven and evidence-inspired workforce. Empower all employees to make data-based decisions, instead of relying on instinct and past experience.**
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Encourage curiosity, exploration and culture change

Besides identifying a use case, the other primary focus in this initial step should be to instill a culture of curiosity and exploration in your workforce. It's an ideal stage for studying the potential benefits of big data and analytics, learning the fundamentals and experimenting to better understand the possibilities of the technology. Plus, encouraging staff to reexamine every process and use case develops the curiosity needed to infuse analytics everywhere—not just updating traditional data-driven applications, but locating areas where big data and analytics can fundamentally change the way the business operates.

Go beyond the usual suspects: Think creatively to find more uses for big data and analytics

The flexibility of big data and analytics allows you to ask and answer questions that were never even considered possible with traditional analyses. Encourage your team to uncover new applications for big data and analytics with strategies like these:

- Create a challenge to have team members find interesting insights in a particular set or source of data.
 - Hold contests, hack-a-thons and other competitions (with incentives)—both internally and externally—to encourage analytic experimentation.
 - Institute a role within teams—someone who is tasked with challenging the status quo, pushing for ways to incorporate new data and analytics and encouraging everyone to think of unconventional solutions.
 - Use third-party communities to help frame and solve issues quickly, and then apply that learning to your use cases.
 - Establish partnerships with universities to bring in fresh thinking, identify potential employees and increase the skill of your current workforce as necessary.
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Step 2: Establish the right architecture and funding model

The Establish step is where you put into place the ideas, strategies and technologies developed through your Identify investigative work.

While the Identify step created the master plan for realizing big data and analytics benefits, you now need to build against it, starting with your most pressing needs. Which capabilities are most critical for the first use cases, and what software and services do you need to realize them? You may already own technologies that can fill some of the gaps. Perhaps you use business intelligence capabilities for reporting and dashboards, but you can augment that with predictive analysis capabilities to better forecast what could happen given the additional inputs now available. Remember to keep security, privacy and governance in your sights at this stage. Bypassing them now could require significant rework later.

Don't be afraid to call in outside help from consultants or strategic services if you need it. An outside perspective can help you break through bottlenecks, leverage lessons from other organizations' experiences, and develop a clear, goal-oriented technical architecture as you move through the Establish step.

After determining the necessary platform capabilities needed, you must couple them with the right computing environment. It is essential to choose a processing infrastructure that can be easily scaled and shared as teams and demands change. New deployment options allow you to plan how big data initiatives will run inside and outside your organization, including:

- On-premises
- In the cloud (public or private)
- As a service
- Hybrid—a mix of cloud and on-premises or other deployment methods

The right deployment method can make or break a big data and analytics initiative. Evaluate them carefully as the foundation of an environment well-suited to exploring and discovering data relationships and correlations that foster additional insights. For example, data scientists could analyze raw data from big data sources alongside data from the enterprise warehouse and several other sources in a sandbox-like environment. The scientists could then combine any newly discovered high-value information with other data to help improve operational and strategic decision making.

Since experimentation is a hallmark at this step, be open to new technologies and skills available in the market to accelerate your progress. Also, make sure you have full support from both business and IT as you move forward with big data and analytics projects. This will help ensure you deploy the right capabilities at the right time for maximum benefits—and keep everyone engaged.

Does everything lead to transformation?

Not necessarily. Transformation should remain a goal in any and all planning, but you may discover that the organizational appetite to transform lags behind your ability to effect change. This is where big data and analytics leaders must keep their fingers on the pulse of the enterprise and adjust expectations accordingly. You may encounter enthusiastic and willing participants in some areas of the organization and find less cooperation in others. Organizational change management is critical and cannot be bypassed under the banner of “transformation at all costs.”

To prevent resisters from delaying adoption efforts, maintain a keen awareness of organizational cultural dynamics throughout the process. Continue to test those dynamics for flexibility, but beware of pushing your organization too far too fast; it could dismantle your hard-won gains.

Step 3: Prove value to business leaders through pilot programs

Step 3 is where it's time to make the vision, investigation and prototyping a reality. In this step, you develop the implementation plan for the choices made in the Identify and Establish steps.

Organizations typically excel at measuring well-understood data but get bogged down in the metrics and lose sight of the ultimate goal: to grow, improve and transform the business. For example, a human resources team may be so focused on producing reports and dashboards for executives that they are unable to find the time to help identify employees who are at risk of leaving in the next quarter.

To prevent this, focus on developing proof-of-value tests to validate the ideas and requirements associated with implementing your big data and analytics initiatives, as well as define the expected returns. This type of experimentation can trigger greater understanding of the project's usefulness in the broader business community. Always remember that you are working—within a defined, limited scope—to understand and test the technologies and skills required to capitalize on expanded types of analytics on new sources of data, and how they will deliver concrete business value. Strive to build small successes with individual projects. When those small successes achieve big results, the organization's appetite for change skyrockets.

Be sure to consider both quantitative and qualitative results in evaluating the impact of your use case. After your analysis, if you find that a project is failing to meet your stated requirements, you must make the hard decision to curtail these activities, and then adjust and reshape your goals.

Step 4: Scale by expanding to additional use cases

Once the initial use cases are established and achieving the desired outcomes, the next step is to scale big data and analytics into other areas of the organization. Ideally, you will be able to cycle through the initial steps more rapidly for any new imperatives by applying lessons learned from the initial journey.

However, you must also continue to manage your original use case projects to maintain and extend their value. You cannot simply “set it and forget it”; left alone, the deployments can become stale or limited as information demands and workflows evolve. Continual evaluation and assessment will keep processes running smoothly, while new technologies may open up additional access and analysis paths.

Efficiency is a top concern during the Scale step. One way to minimize unnecessary rework is to establish a center of excellence where the benefits of skills, expertise and knowledge can be shared and leveraged for all. Reuse or reference results and efforts from previous successes rather than starting from scratch each time. By sharing best practices and lessons learned, your business can improve its big data and analytics efforts more quickly and achieve greater long-term value. There’s nothing worse than underutilizing already-paid-for investments when they easily meet the requirements of new use cases.

It’s critical to remember that success at this level is equal parts technology and business culture. To maintain excellence and momentum after the initial project excitement, the CDO must sustain and enhance the value of the program by guiding the agreed-upon road map and shepherding these business-critical programs throughout the organization.

Step 5: Transform to a data-driven culture

When you reach this step, big data and analytics have become a central, dominant focus of your business; they drive every decision, fuel every interaction or engagement, and power every process. While your organizational changes and successes have likely been dramatic, you can’t rest on your laurels—big data and analytics is an investment that requires attention and discipline to maintain, as noted in the Scale step.

Although this journey is described as a series of steps, it’s not a project with a beginning and an end. You will progress at your own style and speed. Investments will wax and wane depending on business conditions and imperatives, but the increasingly strategic use of information—and developing it into business-critical knowledge and actionable insight—remains the central constant. The important thing is that you manage your data in increasingly strategic ways, turning it into information, knowledge and eventually, advantage.

Plan your journey to business transformation

Harnessing all data and analytics to extract valuable insight sharpens your organization's competitive edge. It also introduces risk. If unaddressed, a rising tide of big, complex data can obscure visibility and degrade business and IT execution, while business rivals turn it into their advantage.

Successfully transforming your business with big data and analytics requires services and technologies that can handle a vast amount of information and facilitate a predictive analytics process that is fast, agile and scalable. The five-step progression defined in this paper presents an approach to identifying, assessing and deploying big data and analytics that repositions it as a central engine for your business. In the age of big data, this proactive strategy, combined with proper support, guidance and follow-through, can set your business apart in an increasingly crowded marketplace.

For more information

As you embark on your journey to business transformation, there are several resources you can use to solidify your plans, share ideas, learn about emerging technologies and best practices, and participate in like-minded communities.

The IBM Big Data & Analytics Hub (www.ibmbigdatahub.com) is an extensive source for timely information, content and conversation regarding big data and analytics for the enterprise.

The IBM Analytics Zone (www.analyticszone.com) is an online community for all things analytics.

Big Data University (www.bigdatauniversity.com) makes big data education available to everyone, helping you start and maintain your big data and analytics strategy.



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