

Getting Big Value from Big Data

Focus on the opportunities, not the obstacles, with advice and a practical six-step guide from SAP's value management experts.



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Embark on your Big Data journey with confidence

Executives are being urged to go beyond business intelligence (BI) to create brand new capabilities and models based on “Big Data”. So, if you’re not yet using Big Data to your advantage, it may only be a matter of time before your competitors do. Studies continue to reveal that enterprises with a significant investment in Big Data are generating excess returns and outpacing their rivals by a significant amount. However, as is typical with new capabilities of this sort, currently a very small fraction of organizations are achieving such results – the vast majority are failing to exploit Big Data effectively for competitive advantage.

GETTING STARTED, KEEPING MOVING

CEOs and executives everywhere are eager to start mining this opportunity, but beyond the high level expectations set by thought leaders and consultants, very little practical guidance exists. Many questions remain unanswered, such as:

- How am I supposed to build this business program?
- What are the practical steps my organization needs to take?
- Who should lead this? Is my CIO’s team capable of delivering on this, or do I need to task someone else?
- How do I ensure we don’t boil the ocean on this and turn it into another Y2K?
- When should I expect to start seeing returns on this, and where will they come from?
- What do we want to build as a core capability, and what do we want to outsource to technology vendors? What is the plan to build the core capability?

Understandably, many organizations are struggling to figure out where to begin in defining their Big Data strategies, let alone how to mature their Big Data capabilities.

From an IT perspective, there are challenges around infrastructure and architecture. These can be addressed with a trusted technology partner such as SAP, that has provenance in transactional, analytic, mobile and machine-to-machine innovation (see page 17 for further information on the SAP® Real-Time Data Platform).

From a business perspective, a successful Big Data initiative requires a combination of vision, talent, and tools to extract value from vast reserves of data that can be applied to customers, suppliers, processes, the bottom line, and business growth.

The key is to focus on the opportunities and rewards of Big Data initiatives rather than getting stuck in endless discussions about technology. The technologies supporting this space are evolving so fast that investing in capabilities is more important than investing in individual pieces of hardware and software.

How this guide will help

To help you on the journey, this three-part guide will:

- Dispel some of the hype and myths around Big Data
- Offer practical steps to get you started
- Point you towards some best practice techniques that will help you get maximum bang from your Big Data buck



PART A: Big Data – The hype versus reality

Definition of Big Data:

A business capability centered on exploiting information flows, to radically improve organizational performance.

As with many disruptive capabilities, our first challenge is a semantic one: to understand what is really meant by “Big Data”.

The phrase was coined a few years ago. As the cost of storage fell, the boundaries of computing advanced, and yet organizations struggled to make sense of data at scale. But size, speed, and variety isn't the be-all and end-all. Less than five years ago, approaching Big Data as a data management challenge made sense; today that perspective is passé. Now the term is a catchall that describes exploiting internal and external information flows to radically improve organizational performance. So it's not important how many petabytes or zetabytes of data your business has accumulated – the issue is how to get big value from Big Data, by exploiting its combination of speed, complexity, and diversity.

Big Data is neither a problem nor a solution in itself or even a single technology. It's an opportunity to develop a foundation for decision management systems, incorporate new business signals into human and machine workflows, and drive growth and profit through innovation.

Big Data can enable new applications and extend the value of older ones, particularly in the domains of marketing, fraud prevention, risk analysis, and asset monitoring. That might involve bringing more granularity to a straightforward customer segmentation; something more complicated, such as updating a maintenance technician's service routes in real time; or even sophisticated preventative maintenance using repair robots mobilized by wear, tear, and performance triggers, to minimize production downtime. The table “Examples of Big Data Opportunities” lists additional examples.

One of the most popular aspects of Big Data today is the realm of predictive analytics. This embraces a wide variety of techniques from statistics, modeling, machine learning, and data mining. These tools can be used to analyze historical and current data and make reliable projections about future or otherwise unknown events. This means exploiting patterns within the data to identify risks and opportunities, such as cross-sell and up-sell targets, propensity to churn, economic forecasts, credit scoring, or insurance underwriting.



PART A: Big Data – The hype versus reality

Examples of Big Data Opportunities

Big Data Opportunity	Examples of Impact
Make information transparent and usable at higher frequency	<ul style="list-style-type: none"> • Enhance the customer experience as it's happening • Shift from adversarial to collaborative relationship throughout the supply chain
Provide more detailed performance insight and expose variability	<ul style="list-style-type: none"> • Monitor and maintain the availability/capacity of interconnected infrastructures such as utility grids, computer networks or manufacturing facilities
Inventory allocation transformed from a batch to an interactive process	<ul style="list-style-type: none"> • Accurately predict consumer demand against stock levels and adjust in-the-moment promotions
Shift from low frequency forecasting to high frequency "nowcasting"	<ul style="list-style-type: none"> • Adjust business levers on a just-in-time basis
Conduct controlled experiments, what-if analyses, simulations and modeling	<ul style="list-style-type: none"> • Understand the impact of decisions before taking action
Identify concealed relationships, patterns and trends within data, e.g. individual or group behaviors	<ul style="list-style-type: none"> • Anticipate and avert business problems or risks before they materialize • Spot and stop fraudulent activity in the act • Identify compliance and security breaches and halt them immediately
Produce more granular segmentations	<ul style="list-style-type: none"> • Enable much greater personalization of products, services and offers
Drive development of next-generation products and services using the "Internet of Things" or personal location data	<ul style="list-style-type: none"> • Proactive maintenance of assets before component failures occur • Contextual promotions based on time of day and/or vicinity
Real-time financial processes, such as cash flow management and cash forecasting	<ul style="list-style-type: none"> • Maximize utilization of cash and minimize liquidity risk • Enable iterative period-end close in parallel with continuous accounting entries

Of course, these outcomes don't happen spontaneously – there's a legacy to contend with.

Traditional IT systems, processes, and skill sets simply weren't designed to cope with the challenges and opportunities provided by Big Data. Analysis and reporting have been typically based on a foundation of historical data – akin to a driver looking in the rearview mirror to anticipate the road ahead. Insight is often trapped within a bedrock of data that has either been discarded or can't be processed due to technology limitations.

As a result, IT departments are having to rethink the way they deal with data and reconsider how to collaborate with increasingly tech-savvy business functions, such as marketing, that are looking to undertake autonomous Big Data initiatives in pursuit of specific departmental goals.

In fact, Big Data projects have a 55% failure rate and, because the resource investment and expectations are so high, when they fail, they fail big. Successful initiatives, on the other hand, have two common characteristics. First, an acceptance that this is not a technology initiative at all – it is a business initiative with technology underpinnings. Second, a willingness to pilot, test, and scale.

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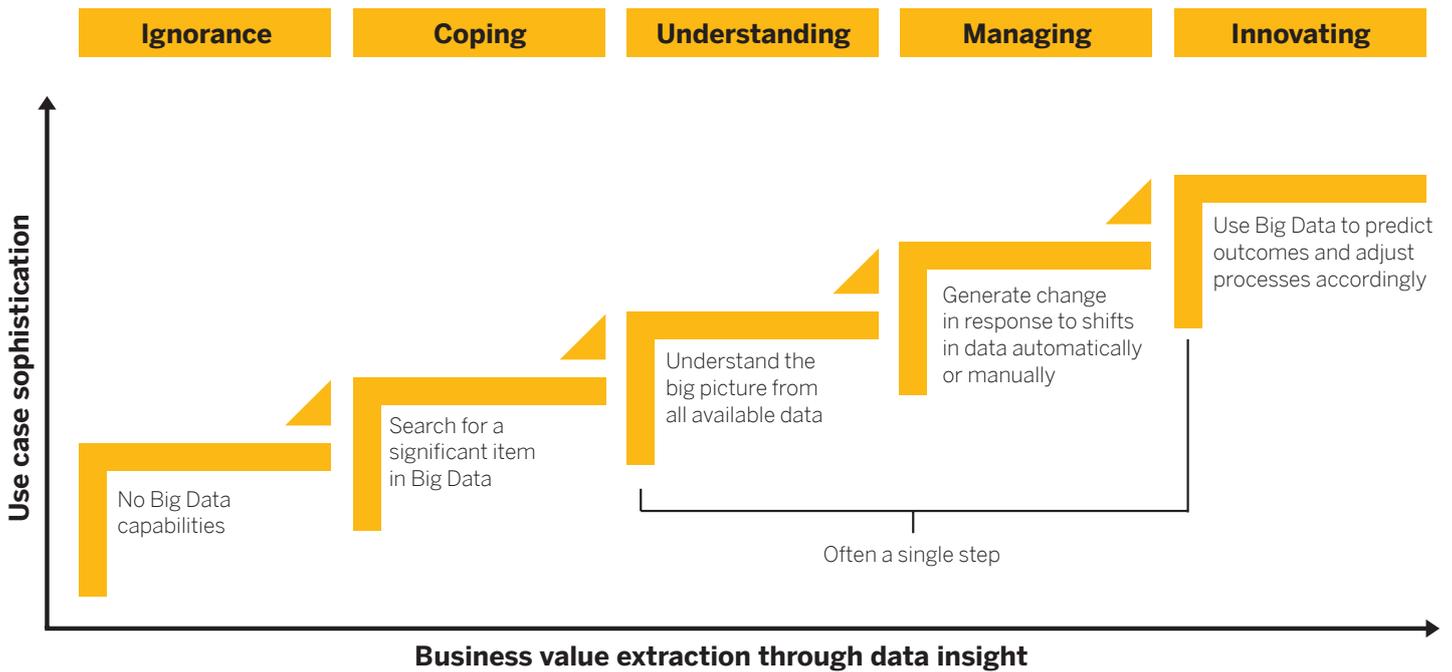
How can you avoid the 55% failure rate of Big Data projects? Recognize that Big Data is not a technology initiative but a business initiative requiring technical know-how.

PART A: Big Data – The hype versus reality

How far is your organization along its Big Data journey?

A solid answer to this question requires the use of a maturity model – one that goes well beyond the traditional BI maturity models that most organizations are familiar with. To assess where you are on your Big Data journey, SAP has defined five levels of Big Data maturity, from “Ignorance” to “Innovation” (see Figure 1).

Figure 1: Five Levels of Big Data Maturity



Of course, not everyone needs to be at “Innovating”. Not everyone needs to invest the resources required to be at this level, and advancing just one stage from where you are today can yield substantial incremental benefits. What’s more, moving up the chain requires buy-in from a lot of people inside and outside of IT, an investment of time and resources, and a willingness to learn from failure.

The bar for each level of the maturity model is significantly higher here than the BI capabilities of most companies. For example, a company is at level 2 (“Coping”) if it is able to successfully search for a significant item across multiple sources inside the organization and return an intelligent answer in a Google-like way. That goes well beyond a text search. Where your enterprise should figure on this evolutionary path will depend on the use cases you want to implement.

PART A: Big Data – The hype versus reality

How to move from one level of maturity to the next

Moving from one level to the next depends on achieving best practice in five key areas (see Figure 2):

- Use Cases
- Information & Architecture
- Standards & Processes
- People & Skills
- Governance

Figure 2: Big Data Maturity Model (excerpt for 2 levels)

	Ignorance	Coping	Understanding	Managing	Innovating
Use Cases	No Big Data business programs, seen as technology <ul style="list-style-type: none"> • Only technology evaluations • No business exploitation of machine data, social media data, logs, email, in analysis • Only historical reporting. Information reliant on lagging indicators • Executive KPIs only 		Understanding and Managing Big Data insights <ul style="list-style-type: none"> • Multiple Big Data use cases against a corporate information architecture • Insights into big picture understanding and comprehensive process analysis • Automated responses • Machine-2-Machine • Operational efficiency and effectiveness • Big Data used routinely 		
Information and Application Architecture	No Big Data in any process <ul style="list-style-type: none"> • Significant variances between BUs • No access to Big Data • Users get what IT gives • No enterprise standardization • No documentation • No information architecture 		Big Data Projects across business <ul style="list-style-type: none"> • Global Big Data architecture • Integrated information and self-service Big Data • Central tech support • Up-to-date documentation and use case index • System consolidated • Business drives capability and architecture delivery of these 		
Standards and Processes	Do not exist or are not uniform <ul style="list-style-type: none"> • No service level agreements (SLAs) • Design, development and management processes are informal • High use of generic BI objects or heavily customized development • No reuse of data or information • Non-standardized master data • Data ownership is undefined or conflicting 		Exist and are not uniform <ul style="list-style-type: none"> • BI process and standards are documented but not always followed • Formal SLAs for data policies • Moderate to heavy reuse of information • Master data standardized to large extent • Each major data area has a senior champion who drives data standardization and quality • Self service • Awareness of metadata and change processes • Active process participation by key users • Predictive capabilities limited to expert department 		
People and Skills	No specific skills, executive audience, personal service <ul style="list-style-type: none"> • Lack of understanding skill of data and metadata • No targets around information contribution or usage • No training available to understand data • No awareness of information sources or Big Data Strategy 		BI roles, stakeholders and regular information skills <ul style="list-style-type: none"> • Understanding how important information is • Contribution to information improvement • Formal training programs • Some self service and statistics skills • Active contribution to governance and quality programs • Multiple roles and distributed skills to facilitate change 		
Governance	No Big Data governance <ul style="list-style-type: none"> • Technology-centric organization and implementations • No/little business participation in projects • No data quality/controls • No BI competency center • Data access limited to few key individuals • No explicit security or sharing controls • Big Data technology understanding based on hearsay and individuals' hobbies 		Competency center & Big Data governance <ul style="list-style-type: none"> • Business ownership of information assets • Centralized Big Data architecture • Shared governance of information assets • Some unstructured data capabilities • Big Data specific visualization capabilities • Rules and automation centric Big Data • Security and authorizations becoming uniform • Active ILM processes 		

PART A: Big Data – The hype versus reality

IT architecture is just one of the five key areas, so it pays not to focus too narrowly on infrastructure issues, like investing in Hadoop clusters, until you know where you need to get to.

How does the average company fare on the maturity scale?

For the sake of simplicity, let's assume your level of maturity is "Understanding". Your company's characteristics against each dimension probably look something like this:

Big Data Maturity Level 3: Understanding	
Use Cases	<ul style="list-style-type: none"> • One trial exploration of Big Data within a line of business, e.g. marketing • Primarily search-based use cases to find actionable insight in complex data • No benefit tracking beyond the line of business
Information & Architecture	<ul style="list-style-type: none"> • Some isolated Big Data applications • IT architecture technical only • No business understanding of impact of information on other business units
Standards & Processes	<ul style="list-style-type: none"> • Evolving effort to formalize through documentation • Low to moderate reuse of information • Occasional executive interest in data when considering major initiatives
People & Skills	<ul style="list-style-type: none"> • Awareness of the absence of information • Limited skills to bring data into decision-making • No linkage of information practices to corporate strategy
Governance	<ul style="list-style-type: none"> • Technical provisioning for Big Data project • No executive governance or information lifecycle practices • Some tactical data quality

To get full details on this maturity model, determining exactly where you rank, and to obtain a customized assessment, take the "Big Data Maturity Model Assessment." Refer to the "Take the Next Step" section at the end of this document for details.



PART B: Getting started – A practical six-step guide

With the promise of Big Data comes the need for a robust strategy to implement appropriate data governance, negotiate the growing lineup of technology alternatives, reengineer business processes, address skills gaps, and demonstrate value. It's common knowledge that most organizations do not yet have a strategy for managing Big Data, whether that involves deploying new data management systems or extending existing systems to accommodate Big Data.

Step 1: Define your use cases

For IT professionals in particular, there is an urge to rush into discussions about data sources or architecture. This is a sure path to failure. The technology and tools are so advanced – and the potential solutions so vast – that one must start first by figuring out what questions need to be answered, then work back to the data (step 2) and architecture (step 4). The mantra of any Big Data project has to be “business value”, making the use case construct invaluable as a starting point.

BALANCING DEDUCTIVE AND INDUCTIVE APPROACHES

In science, there are two ways of arriving at a conclusion: deductive reasoning and inductive reasoning.

Organizations have typically taken a deductive, or “top-down”, approach to data by mining through reams of the stuff in search of nuggets of insight. While this sort of data mining can be a fascinating exercise, it is often time and resource intensive. Data-mining techniques certainly have an important role to play, from helping get your arms around data sets by using descriptive statistics to developing simple business rules. Moreover, insights gleaned can often be directly embedded into existing business processes to create entirely new and differentiated capabilities – for example, identifying segments in customer sales data by merging demographic information.

However, a much more impactful approach is to start with the destination in mind, by identifying what questions you need to answer for the business. This is why inductive reasoning is so powerful at the start of use case development: it starts with hypotheses that lead on to a series of questions that data helps to answer. This approach results in a much clearer understanding downstream in the process of what data is actually relevant, given the use cases you are trying to pursue.

For example:

- Data you need might already reside in places you typically would not mine, such as web logs, call logs, and clickstream data
- You may find that unstructured data is where the nuggets lie, so you need to use techniques such as text mining to gather insight
- There may be opportunities to mash up data from external sources or from machines or to merge data with your own transactional data

PART B: Getting started – A practical six-step guide

Top tips for identifying use cases

LOOK AT WHAT YOUR ORGANIZATION IS ALREADY DOING

What could be done better with Big Data techniques, such as mashing up social sentiment with product data or developing new pricing models based on user profiles?

LOOK AT WHAT OTHERS IN YOUR INDUSTRY ARE DOING

Perhaps you are not doing some of those things, or maybe you can do some of them better and get superior results. SAP's industry value advisors are a great source of information on best practices for vertical markets (see page 16) and check out our value maps for your industry at:

<http://rapid.sap.com/se>.

APPLY 'DESIGN THINKING'

This approach can help you to identify brand new, previously unconsidered use cases (you'll find further information on Design Thinking on page 16 of this guide).

DEFINE THE USE CASES BY OUTCOME

These may be cost focused rather than revenue focused – for example, by predicting when a component is likely to fail, you could optimize maintenance schedules and spare inventory.

PRIORITIZE AND VALIDATE THE USE CASES

Rank them in order of anticipated benefits, and validate your business goals with all stakeholder functions. If the goals are valid, what decisions need to be made that would move the needle on those goals?

ESTABLISH CLEAR TARGETS, SERVICE-LEVEL AGREEMENTS, AND KEY PERFORMANCE INDICATORS FOR YOUR CHOSEN USE CASE

If you don't define success, how will you know what success looks like? For a given use case, the definition of success can vary by stakeholder, as in the example below. You'll want to be as clear as possible on how the use case will help each stakeholder.

To give customers a jump-start on the process of use case definition, SAP has documented Big Data use cases for each major industry and organized them according to Big Data maturity. For those customers that want a more hands-on, collaborative approach, SAP also offers expert-led Big Data workshops focused on use case development and design to value. Part C of this paper – "Help is at hand" – gives details on these offerings (many of which are complimentary for our customers) and provides information on how to contact us to access these.



PART B: Getting started – A practical six-step guide

Step 2: Discover your data

The biggest challenge most enterprises face is understanding their overall business data – knowing what data exists, its size and composition, where it's located, its source, how it is managed, its dependencies, and how it integrates with other systems.

That means carrying out an audit, which requires an understanding of how various applications share and access enterprise data. In the past, around 95% of data was under IT's control. However, data ownership has been increasingly devolved to business units or departments – it's not uncommon, for instance, for marketers to be the custodians of customer relationship management data. Therefore, IT should survey functional leaders to sweep up everyone's data demands and start by tackling a few applications at a time, understanding the metadata, interfaces, and application requirements and how quickly the data needs to be accessed.

CHECK UNDER THE BED

Don't just confine the audit to the servers in your data center – consider storage arrays, archive storage, data at remote offices, data on mobile or portable devices, cloud, and third-party systems. Take into account how much data is archived and where – in-house or outsourced, on-premise or in the cloud.

DON'T OVERLOOK THE ORDINARY

Certain types of data may be collected for one purpose but can be used to do something completely different, known as "secondary uses". It's important not to dismiss these potential gold mines, such as operational logs or e-mails. Prosaic as they may be, these assets could be hiding some real business revelations – for example, by counting the number of logs or impressions, you may be able to identify pain points or unmet needs that your competitors haven't yet spotted.

MINE OPPORTUNITIES IN MACHINE DATA

Think about how machine data could be exploited to improve operational effectiveness or reduce costs. What if equipment performance data could be used to trigger another machine into action, such as ordering a replacement part, instead of relying on human intervention?

CONFIDENTIALITY AND COMPLIANCE

When it comes to customers and business partners, identify what (if any) issues exist around privacy, security, and intellectual property and make sure you won't fall foul of any prevailing industry-specific compliance requirements.

PAY ATTENTION TO NEGLECTED DATA

Once you have a full inventory, evaluate what data can be used for decision support and what's being collected but is currently not utilized for analysis purposes. Consider what will help you get to know your operating environment, your customers, and your competitors more intimately.

LOOK OUTSIDE

Big Data only gets really interesting when you step beyond the four walls of your enterprise to combine internal and external data. This could take the form of customer comments eavesdropped from social media or the movements of employees, customers, or assets extracted from location-based data.

READ THE SIGNS

Next, determine what business signals could be inferred from data. For example, customer sentiment analysis could help you predict an individual's or profile group's propensity to churn, so you could incentivize or reinforce their loyalty before they make the switch.

SEE THE WOOD FOR THE TREES

As well as identifying what's useful, it's just as important to determine what you don't need. That way you can avoid the ongoing cost and effort of collecting, maintaining, and moving unnecessary data around – and you may even be able to offset any tangible savings against your Big Data initiative to accelerate ROI.

DON'T OVERLOOK THESE LESS OBVIOUS SOURCES OF BIG DATA

- Images
- Human language, audio, and video
- Web logs, call logs, and clickstreams
- Event data streams from applications, sensors, or RFID tags
- Transactions
- Geo-spatial data
- Personal productivity files (spreadsheets, documents, presentations, PDFs)
- E-mails
- Social data (blogs, tweets, reviews, and ratings)
- Scientific data (for example, genomes, physics)

PART B: Getting started – A practical six-step guide

Step 3: Do an initial evaluation

The liberating aspect of Big Data initiatives is that you don't have to defer gratification indefinitely: you can get started, experiment, and learn along the way. However, the tighter your up-front definition of what you hope to gain from Big Data, the more focused your experimentation time will be and the quicker you'll refine your skill set and create business value. Ask yourself:

- Did the data meet our requirements for the outcome?
- What is the likely cost-benefit calculation?
- How many core issues and edge issues remain and are they within our control to fix?
- What is the realistic timeline to deliver the first benefits?

Step 4: Design your architecture

It would be remiss to delve into Big Data architecture without getting a little bit technical. The key is to understand that there are multiple layers in the taxonomy of Big Data, and simply because you have a tool or technology in each layer does not mean that it will serve the purpose demanded by your use cases.

BENCHMARK YOUR CURRENT ARCHITECTURE

Big Data architecture needs a common language, so we've developed a taxonomy to help. For assistance and pragmatic guidance, our Big Data Taxonomy Assessment can help you quickly assess and benchmark your organization's current capabilities in each area of physical architecture.

Answer a simple questionnaire at <https://valuemanagement.sap.com/BigData1> to get an instant analysis and optionally receive a full report on the findings.

Taxonomy	Definition	Examples and Tools
Source	Structured, unstructured, and semi-structured data from trusted systems, repositories, productivity applications, logs, measurements and embedded sources, networks, external and untrusted sources, purchased sources	Voice, images, video, documents, e-mails, logs, fragments, codes, message generators and devices, social media, geo-spatial data, market data
Acquire	Data integration, streaming, content crawling, indexing	SAP NetWeaver® technology platform, SAP® Sybase® Event Stream Processor, SAP NetWeaver Business Warehouse application's extract, transform, and load functionality
Transform	Data governance, data quality, natural language processing, pattern finders	De-duplication, enrichment, translation, text analytics, event stream processing, aggregation
Stage	Data warehouse, files store, application store, analytics store	SAP Sybase IQ database software, SAP Sybase Adaptive Server Enterprise, SAP HANA® platform, Hadoop, file server, master data repository
Model	Prepare the information for consumption, including explore, report, research, predict, auto-decide, embed, calculate	Data exploration, business intelligence, business warehouse, enterprise search, embedded analytics, predictive analytics
View	Visualization layer allowing input into human planning and decision making	Reports, ad hoc analysis tools, enterprise search, data exploration, predictive analytics, dashboards, visualization tools
Exploit	Distribution to information consumers or partners, integration with devices or mobile, embedding into decision support and corporate strategy	Mobile analytics, portals, reports, automatic device behavior programming, learning algorithms and feedback loops

PART B: Getting started – A practical six-step guide

Step 5: Implement your Big Data initiative

Big Data is not a “one and done” activity – it’s an exercise in change management. You need to create a long-term vision for how to get there and work iteratively to gather momentum and competency.

Start with quick wins that have a narrow focus, are based on existing internal data, and build on your successes. Then expand into new target audiences, with new offers, via new delivery channels, or using new data sources (especially external ones) and new capabilities (such as text analysis) as you gain confidence.

By this stage you are off and running. Over time, however, you will need to move from pilots and tests to a scalable business capability.

A cautionary note on data governance

Big Data can cause big headaches – a billion records of bad data will not lead to smarter decisions! Many systems create and store data in isolation, resulting in data that is misaligned, duplicated, or inconsistent. The problem of poor quality data is compounded when you try to obtain a 360-degree view or implement joined-up business processes.

Data governance isn’t an IT thing. It’s a company thing. Getting it right requires a management discipline that spans people, processes, policies, and metrics. Fortunately, there are tools available to make it easier for you to automate, monitor, manage, and report on data quality. These take into account the entire information lifecycle – from creation or capture through to archiving and deletion and everything in between.



PART B: Getting started – A practical six-step guide

Step 6: Make Big Data a business capability

Only by working out what you've got will it become clear what you lack – and that doesn't just mean infrastructure but people and know-how, too.

CONSCIOUS COMPETENCE

Identify whether your internal skill sets align with your data composition. If you mostly outsource, you may need increased project management skills to deal with external vendors than if data were retained in house. If your data is primarily in the cloud, you'll need people that are familiar with cloud storage.

For any skills gaps you identify, you'll need to consider how resources can be realigned, trained, or hired. While consultants have their uses, you'll need to cultivate these skill sets internally in tandem to avoid an unhealthy level of external dependency that could build up a large cost and potentially destabilize your progress in the future.

Think about what skill sets you want to build internally to create a Big Data competency center or "Center of Excellence." This involves setting up a cross-functional team with specific tasks, roles, responsibilities, and processes for supporting and promoting the effective use of Big Data across the organization. This type of organization is part of the overall Big Data maturity model, but also has its own development path (see Figure 3).

Figure 3: Big Data Competency Center Development Path



GETTING BUY-IN

Technology only gets you so far. Serious Big Data initiatives won't get off the ground without the right governance and stewardship. You'll need to ensure you have the right team, champions, and stakeholders on board:

- **Start at the top** – When putting together the strategy, make sure you have buy-in, support, and sponsorship from executives
- **Get input from the middle** – Line of business management is best placed to translate missions into objectives and determine the metrics used to measure success
- **Lay a rock-solid foundation** – Ensure you have the IT infrastructure, applications, and governance processes in place to bring it all together



PART B: Getting started – A practical six-step guide

DEVELOPING A ROAD MAP

Big Data is a team effort, so everyone needs to be on the same page. A road map can formalize this understanding and ensure that both IT and business leaders are pulling in the same direction.

- Ensure you spell out any standards depending on your organization's needs or even cultural preferences, such as the transition from structured-only to semi-structured to unstructured data
- Determine the preferred platforms and interfaces for capturing, storing, and processing each form of data
- Design a workflow for managing Big Data forms in their original state, plus one for processing it into other states for the purposes of customer intelligence, data warehousing, discovery analytics, or whatever else your business demands
- Use pilot studies to figure out your methodology, then get review and approvals and quantify the value you expect to achieve before committing to throwing any serious budget at broader initiatives
- Deploy the analytical tools needed to achieve your goal as well as predictive models to anticipate future needs or issues
- Become an expert on the data in your company (no superhero costume required), and lead by example by using the best data available and documenting any gaps to justify collecting additional data

Refer back to the Big Data maturity model on page 6 for a comprehensive view of where you are along your journey. Then benchmark yourself against other organizations if you need to demonstrate to senior executives where your organization needs to improve capabilities, whether that be in "People and Skills", "Use Cases", "Governance", or "Standards and Processes".

A QUICK RECAP

Now it's time to start harnessing the real-world benefits by deploying Big Data applications and analytics that have the potential to ignite new business models and revenue streams.

Empower everyone from the shop floor to consumers with new insights anytime, anywhere

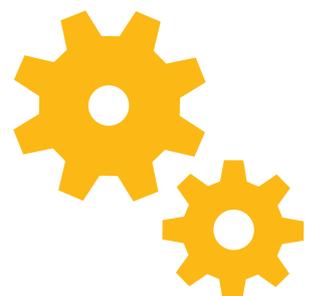
- Build an information culture that makes data-driven decisions
- Innovate new products and services to market quicker
- Satisfy customers' needs for products, services or interactions in new ways and build long-term loyalty

Monetize insights directly in business processes with Big Data applications and analytics

- Drive repeated value from Big Data insights into daily business operations
- Drive measurable value for targeted business problems
- Optimize business processes over time

Optimize organizational performance in real time

- Empower lines of business to monitor operations with self-service visualization tools that meet specific functional needs
- Explore up-to-the-minute data to identify opportunities and problems on the horizon
- Detect and act on potential fraudulent behavior or operational and financial risks before they impact your business



PART C: Help is at hand

So, Big Data can help you achieve “Big Impact”. You’re eager to steal a march on your competitors – but being a pioneer can be a lonely and precarious existence. Fortunately, experienced, objective, and expert help is at hand. SAP can co-innovate with your organization in a number of ways – take your pick from the tools and techniques we can bring to your Big Data initiatives. Then contact SAP’s Big Data experts in your region (see page 18 for contact information) to get started.

TAKE A SHORTCUT

For more than 40 years SAP has worked with customers who are leaders in their respective markets. Over time, we have accumulated knowledge of industry-specific best practices that we infuse into our product development processes.

As a result, our solutions come with pre-configured role- and industry-specific content to help you reach productivity and value faster, without needing an internal customization project.

GET HANDS-ON AND KICK OFF

Take advantage of a half-day workshop focused on “Getting Started with Big Data”. The format and content are designed to help you quickly pinpoint where you are on your Big Data journey and where you should go next for the most value. Learn from experts, and exchange ideas with other organizations on similar journeys.

If you are past the overview stage and want to jump straight into it, SAP offers a full-day workshop at your offices to identify and get started on your two most important use cases or customized working sessions to dive deep into your specific architecture considerations and co-develop the road map needed to make your use cases come to life.

GET SOME DESIGN THINKING

Design Thinking is a set of methods and processes for investigating poorly-defined problems, acquiring information, analyzing knowledge, and coming up with solutions.

Innovation often originates from the shop floor, not the executive suite, and a solution can answer a need or problem nobody realized they had until they saw it in action. So, as well as a means of problem solving, Design Thinking can be used for problem finding – by identifying underlying, unmet needs in your marketplace, so you can inspire and inform the development of truly innovative products and services. That involves testing ideas and spotting relevance or relationships between seemingly unrelated things or experiences.

We have made Design Thinking an integral part of our business processes, using the concepts with customers daily to help turn their strategies into living prototypes. That means we can work collaboratively, iteratively, and openly with you to:

- Conduct Design Thinking sessions such as customer journey mapping or vision workshops
- Create visualizations to help stakeholders understand the ideas involved and share them easily with colleagues
- Seek out new opportunities by going beyond known pain points
- Prioritize ideas, create road maps, and help build business cases
- Provide you with powerful, reusable Design Thinking techniques
- Show you how to leverage innovations and prioritize initiatives and IT investment

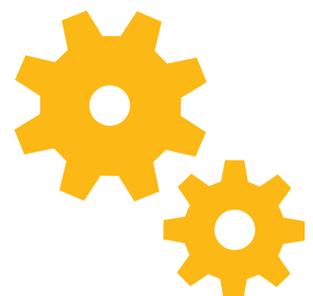
For more information go to http://www.sap.com/campaigns/2013_05_design_thinking/index.epx.

ROAD MAP PLANNING SESSION

We can help you develop a structured road map for your future Big Data needs as part of an interactive working session. Our technology, industry, and solution expertise will guide you on an insightful discovery of both internal and external opportunities.

INNOVATION DAY

An Innovation Day is an opportunity for us to discover the potential of your business. In essence, we spend a day exploring the solutions we can offer that are relevant to your business and industry. We’ll share “The Art of the Possible” concepts that are technologically advanced yet readily achievable, to give you a glimpse of what your business could look like with a technology makeover.



PART C: Help is at hand

OPERATIONAL VALUE CREATION AND BUSINESS ASSESSMENT

Through our Industry Value Advisor team, SAP helps companies to enhance the business processes that contribute to the most important objectives in your vertical market. We provide key performance indicators (KPIs) and best practices to enable companies to closely monitor and tune their performance by connecting processes with business outcomes.

The Value Management Center (<https://valuemanagement.sap.com>) provides comparables for thousands of KPIs as well as best practices for virtually every process by industry, geography, and company size. Enterprises typically take advantage of these resources to assess current performance, identify opportunities for improvement, prioritize those opportunities, and then track them to drive continued performance improvement. These tools and approaches are reassuringly proven – thousands of companies have already applied them to ensure that their projects are delivered on time and on budget and deliver their intended value.

CREATING THE VALUE CASE FOR BIG DATA INITIATIVES

You need to get maximum value from any Big Data IT investments, but poor alignment of business and IT can get in the way. Astonishingly, fewer than one in five companies have a formal business case for their IT projects. Building a business case is more than just an academic exercise for estimating the ROI of a project – it should address the financial, educational, and change management aspects of the project as well. In the absence of a business case, some enterprises find themselves in a position where they have great success stories to share but don't know how to formalize or repeat them.

We can help you document the value to be achieved from your Big Data initiative and close the loop on the original business case. Not only does this allow you to showcase your Big Data project's success internally and externally, it is also critical for your executive sponsors to know the eventual outcome of the project in business terms, so they can continue to support your efforts.

Making real time a reality

If you're embarking on an initiative to deliver new insights, real-time queries, and predictive analytics – with a focus on what's happening in the moment or in the future – you can't afford to lose momentum to creaking platforms and disjointed systems. You need a robust and reliable way to deliver answers and interactions to the edge of the enterprise.

The concept of real-time data management isn't new – it's been around for decades. But only a few businesses have succeeded in building a real-time platform from the ground up that will support the agility and scalability they aspire to for Big Data initiatives.

The problem is, it's not a straightforward matter to integrate data from disparate sources in real time and support an on-demand transactional platform that can handle unpredictable workloads. Budget is often a show-stopper. Many organizations lack the expertise or knowledge to support the programming, administration, and integration requirements of traditional in-memory solutions. A further roadblock is the complexity of existing data sources, as the integration of unstructured data requires a deeper understanding of its association with structured data than many businesses have today.

However, recent technology advances, sharply lower hardware costs, and innovative cloud-based deployment options have helped overcome these issues. A combination of distributed in-memory storage, data virtualization, Big Data solutions, predictive analytics, enterprise data modeling, data governance, and data streamlining and replication tools can deliver an economical real-time data management platform that will satisfy any enterprise requirements.

PART C: Help is at hand

WHAT TO LOOK FOR IN A REAL-TIME DATA MANAGEMENT PLATFORM

- **Use distributed in-memory technology for performance and scale** – Consider using distributed in-memory computing to achieve extreme high performance and scale for applications that need real-time data (or faster access to critical data) and ensure it supports all kinds of data — structured, semi-structured, and unstructured.
- **Look for rapid time-to-value** – Few vendors have yet to offer a comprehensive real-time data management solution. The SAP Real-Time Data Platform can help achieve faster time-to-value through automation and simplification of various integration and implementation steps and support a broader range of solutions, data, and applications.
- **Ask for a road map** – When evaluating solutions, ask vendors how they plan to deliver on the real-time vision. Look at the various components that each vendor has integrated and how they plan to fill in any gaps.
- **Start modestly** – Don't take on a wildly ambitious project that tries to integrate all your enterprise applications into the platform at once. Start with four or five priority applications, adding incremental applications and infrastructure over time.
- **Implement data queries before transactions** – The initial focus of your deployment should be data access – that is, getting applications to query real-time data using standard protocols such as SQL, XQuery, and X-Path. Transactional support should be deployed only after the basic query framework has been established. However, if you're already struggling with transactional scalability, don't hold back!

If that sounds like an extensive shopping list, you'll welcome the news that these components are available as part of a single, software-based architecture for data management and applications that can be deployed modularly. You can see how it all fits together at www.sapdatabasebook.com.

Take the next step

Start now. Sign up for a Design Thinking workshop, do an audit of where and how data is stored in your organization, and inventory your human capital to identify where your strengths and weaknesses lie in data management.



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