



what can businesses do to capture the full potential of big data?

helping companies observe and assess their data sets,
identify potential revenues and mitigate challenges

Business
Services



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introduction



The amount of data in the world has been increasing at an exponential rate; it has reached 295 exabytes¹ and is experiencing a **growth of approximately 50% per year**. In 2020, it is expected to be 44 times larger at around 35,000 exabytes (IDC, 2010). Everything has become digitized, and this has had an effect on the mediums used in the media, communication and entertainment realms. **Data sets have become so large and complex** that companies used to be unable to process on-hand database management tools or traditional data processing applications. This reality is emphasized by the emergence of **new "open" trends** such as the following:

- open source: collaborative work on informatics source code (e.g. Hadoop)
- open innovation: innovation development on collaborative and open projects
- open data: data dissemination and development of collaborative services

Pure players from the Web were the first to uncover the hidden value of data because they knew how to deal with its management. Since these actors (Google, Amazon, Yahoo, Facebook) handled technical difficulties for their own projects based on customer interactions with their services, they were able to create a massive disruption in the market ("Web 2.0" vs. "Web

1.0") and became the leaders in their class (with these respective solutions: Big Table, Dynamo DB, Hadoop and Cassandra). They developed big data tools to collect, analyze and store large quantities of data. **As data analytics and management technology are moving forward with increasing computer power, processing and analyzing data is getting easier**. Storage costs have decreased significantly with the increasing number and lower costs of data centers combined with the arrival of cloud solutions. Capacity storage is expected to be 30 times bigger in 2020 than in 2010 (IDC, 2010). As a result, **data is becoming more accessible, usable and exploitable (in real-time and batch mode)**.

Companies realized that properly collecting and analyzing large amounts of data could help them **improve efficiency and boost revenues**. Extracting valuable insight from endless volumes of data is becoming a key driver of competition and growth for firms. But first, companies need to find a way to make sense out of this data. They must think about how they can **turn data into knowledge** and put that knowledge to work. This is more than just a challenge both in terms of resources and capabilities. Data has swept into every industry and business function; companies must therefore develop **new skills out of their already established core competencies** to face this challenge. The question then becomes, what can businesses do to capture the full potential of big data?

¹ a unit of information or computer storage equal to one quintillion bytes (10¹⁸ bytes)



This white paper aims at helping companies, and more specifically their clients, to realize the potential impact of big data and to **seize big data opportunities**. Big data will radically change the structure of companies and could change the way they do business in the long run. This white paper will give them first **insights and guidelines on how to handle this transformation**. It targets top management, business strategists, managers or anyone looking for a simple and business-oriented explanation on big data.

To define a successful big data strategy that creates value, companies should know how to:

1. **observe and assess data:** know the kind of data your company has and could have, the data ecosystem in which companies are evolving and potential partnerships between companies
2. **identify potential revenues:** understand the ways to analyze its data to create value and business opportunities
3. **recognize and mitigate challenges:** be aware of the business, operational, technological and legal challenges that might be encountered

identify your company data and understand the ecosystem in which you will evolve



Companies need to **define what kind of data will be valuable for their businesses**. They should have a good understanding of data cycles and value chains to know where and how to find valuable data. It will allow them to get rid of irrelevant data later on and to meticulously analyze valuable data **to gain knowledge and capture value**.

A. enterprises need to deal with data volume, velocity, variety and variability; they must assess and map all the data they (could) have

Companies can collect data from **their ecosystem, their activity and their clients**; they can use different channels to diversify their sets of data. They are nowadays delivering an integrated and seamless experience to their customers

who can easily go from one channel to another.

1. identify your valuable data by collecting data from various sources and channels

With these various channels, companies can collect heterogeneous data sets with diverse characteristics. These data sets can either be **structured or unstructured** depending on whether they are already available for use by analysts. Currently, two thirds of data sets are composed of unstructured data (i.e., “dark data”). They are mainly present in CRM (log files or audio), the Web (social media, videos, pictures and audio) or M2M. Conversely, structured data often corresponds to the data collected on clients, which can either be required (necessary for the

data depending on the collection source

collection source	description	examples
Web	<ul style="list-style-type: none"> user-generated content: social networks, file storage, pictures, videos and audio e-commerce: transactional history and data from customers 	<ul style="list-style-type: none"> Facebook, Twitter, YouTube, LinkedIn, Flickr Amazon, Ebay, etc.
machine to machine (M2M) and Internet of Things	<ul style="list-style-type: none"> RFID, sensor networks, etc. log (i.e., mobile, Internet, fixed) and call data records NFC, QR codes, etc. 	<ul style="list-style-type: none"> product localization location-based data, real-time traffic analysis points of sale
commercial data	<ul style="list-style-type: none"> CRM: customer's profile, behaviors, audio, log file data², etc. 	<ul style="list-style-type: none"> transactional history loyalty programs: customer preferences
personal data	<ul style="list-style-type: none"> legal identity, health records, legal information 	<ul style="list-style-type: none"> passport, medical file, criminal records
open data	<ul style="list-style-type: none"> administration files, statistics, etc. 	<ul style="list-style-type: none"> data.gouv.fr data-publica.com

²a record of all communication or events on a software, application, server or computer workstation

source: Orange Consulting

contract) or voluntary (shared by clients through additional services). Overall, **the more contextualized and personalized data that can be collected in real time from their clients, the more value they can get.** The difficulty lies in convincing customers that they would get more specific offers or customized services by giving information to the company. If one company is well informed about its clients' needs and expectations, it could

improve client satisfaction. For instance, they could push offers or coupons at the right time and right place but, in this case, customers must give their consent (opt-in) for the use of their data. It is therefore rather complicated for companies to collect and access this kind of data due to high degrees of protection. As explained in the graph below, data can be flagged depending on a variety of independent characteristics. For each six

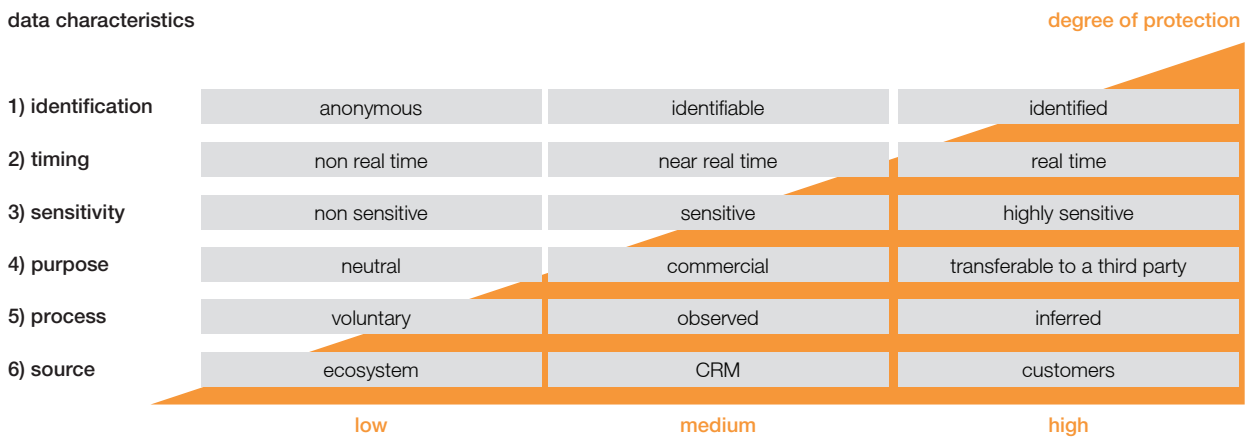
characteristics, there are three identified levels of protection. The level of protection might vary depending on the company's industry.

2. assess your data to be able to use it efficiently at any time

Companies should complete an inventory of data sets in order to get a clear picture of the state of their data sets and their

degree of protection for key data characteristics

data characteristics



glossary

- degree of protection:** three levels of protection for each characteristic (low-medium-high)
- data characteristics:** each independent category that can describe a data set
- 1. identification:** capacity to identify to whom the information belongs
- 2. timing:** time elapsed between data creation and data collection
- 3. sensitivity:** degree to which the information should be kept private (for the individual and/or the society)
- 4. purpose:** reason for which data was collected and analyzed
- 5. process:** collection method used
 - voluntary: data willingly offered by customers
 - observed: data collected on clients' behaviors (via the use of its services)
 - inferred: data generated by cross-checking observed and voluntary data
- 6. source:** place where the data was collected

source: Orange Consulting

characteristics. Then, they need to determine what data is relevant to their business needs. The company could decide to focus on optimizing their process to improve their productivity or increasing sales by launching customized services. From this point, they can start assessing data relevance and identifying which information they need to achieve their goals. They can either **get this information directly with the data they have** (with raw data or “cooked” data) or they need to **collect additional data or more precise data sets**.

In order to collect more data or refine their data sets, companies should consider the following options:

1. open data – looking at public data sets to acquire additional data
2. Web – browsing the Web to access user-generated content
3. commercial data – checking your CRM database, requiring more data from clients during subscription and/or developing loyalty programs to collect additional data on their clients
4. M2M and Internet of Things – collect data in real time on their clients or employees with M2M (i.e., M2M applications with location-awareness capabilities) and Internet of Things (i.e., sensors, mobile logs, etc.)
5. ecosystem – buying this data or teaming up with another company (depending on the company’s big data strategy)

This should enable firms to extract valuable information from their data sets. They could identify the clients behind the data so as to **get a highly qualified customer database for their CRM**. It should eventually enable them to build a strong brand image by developing awareness among a targeted and qualified audience for their marketing and communication campaigns. They could also **increase the value of their data when they collect it in real time since they can offer contextualized services and react quickly to any incident**. Plus, if they can combine data from their CRM and data from clients or the ecosystem (i.e., get inferred data), they can significantly increase the precision and density of the information (e.g., more information on their points of interest combined with their location) and the pushing of personalized location-based services.

Starbucks

let’s take the example of Mr. Smith, a businessman who is always on the go and a loyal customer of Starbucks

Mr. Smith cannot start the day without his venti hot chocolate. He often wakes up early to go get breakfast at the local Starbucks before he goes to work. He pays for his breakfast every day with his Starbucks card to get specific offers or coupons. Yesterday, while getting breakfast, he noticed that Starbucks developed a **new app called “Starbucks iPhone app”** to help find their closest location, to order and pay directly online. It also enables customers to share information on their favorite drinks or their location with their friends on Facebook and Twitter.

Tomorrow, Starbucks could offer **new services** to Mr. Smith such as a promotion on his favorite drink at the store he just passed by. To do so, Mr. Smith would just have to give his opt-in consent to Starbucks, who will use this data to **push customized offers**. Starbucks could, from this point on, collect voluntary data on Mr. Smith and merge it with the data from their CRM to create value. As soon as they analyze this data, they should be able to **get a full profile of Mr. Smith**.

source: <http://www.starbucks.com/coffeehouse/mobile-apps/mystarbucks>

B. corporations need to analyze their data sets to extract value; this requires having a good knowledge of their ecosystems in order to define their data strategy

In the past few years, several big companies invested in traditional master data management solutions (business intelligence solutions such as Cognos (IBM), Business Objects (SAP), etc.) to analyze their own data. It was a good way to optimize their processes, reduce

risks and increase their productivity. But, since potential benefits emerging from data analysis weren't yet fully identified, companies missed some opportunities. They were unable to understand and transform their data sets without today's solutions and a mature understanding of the subject. Companies today are very aware of the missed potential due to an inability to leverage their data, and they assess a loss of 14% of their yearly turnover due to unwillingness to exploit data.

1. define your data strategy and identify data opportunities

Companies from any sector, of any size or in any activity can capture value from big data. Several industries have interesting sets of data on their customers (i.e., telecommunications with Internet and mobile logs, healthcare providers with patients' medical files and banks with daily client transactions). Although companies can know their customers better or sell innovative services based



65% of directors claim that a majority of management decisions are based on data analysis in the U.S.



but **93%** of company leaders say they have missed growth opportunities due to their unwillingness to exploit data



they assess this loss on average at **14%** of their yearly turnover

source: Capgemini, Cisco, IDC, McKinsey, Oracle, US Bureau of Labor Statistics

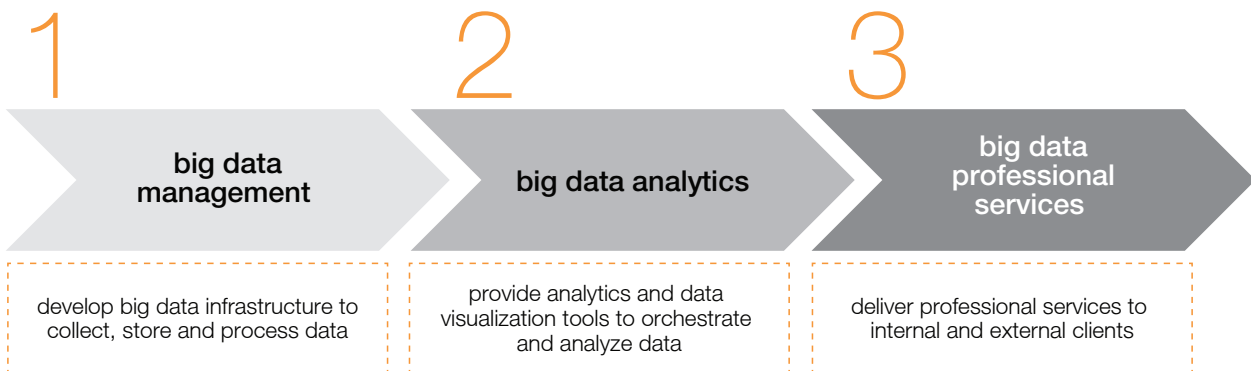
on data analytics, they don't necessarily know where to start, how to position themselves on the value chain and how they can develop an internal **data strategy**. They can only focus on big data professional services and/or develop internal resources to manage big data analytics and management tools.

Here lies the real challenge: determining if launching a data strategy is consistent

with the company's future growth and then **understanding what kind of data it has, its value and the appropriate business model(s)**. This data strategy should include key growth objectives and allocate specific resources (i.e., people, IT and investments). Companies should start small with realistic projects and a pragmatic approach. According to the sector/activity and enterprise size, it is more or less easy to segment and

assess data. Opportunities could be somewhat harder to seize for medium-sized companies. Even if it is an agile and flexible organization, there is often less money to invest and/or lower volumes of valuable data. But it does not mean they cannot benefit from big data. A large panel of big data solutions is available today with a broad range of prices (e.g., open source vs. proprietary solutions).

big data value chain



2. team up with other actors to get value with big data

Companies should consider **collaborating or teaming up with other actors** to add complementary resources and capabilities, enabling both of them to launch their big data project more quickly and efficiently. Collaboration with other actors can sometimes be complicated because they can have opposing views and interests on revenue shares and skills management. Nevertheless, this risk can be mitigated if companies manage to build a short-term partnership to adapt to changing market conditions. Corporations cannot achieve their data strategy alone since interesting data

sets might belong to various actors (i.e., customers and public institutions) and they need specific data solutions to extract, transform and analyze data (i.e., ICT actors). **They need to be very careful in terms of legal issues as processing personal data is highly regulated**. For customers and citizens who are generating high volumes of data (Internet browsing, geolocation, payment transactions, etc.), the situation is clear: **the more transparency companies give to customers on what they do with their data, the more data consumers will willingly share with companies**. Companies should therefore comply with the law and provide specific tools for customers to help them master their own

data such as personal data dashboards. Personal.com, a start-up from the U.S., embraced this new trend and is now offering vaults and dashboards to help people manage their data. YesProfile, a French start-up, goes more in depth and enables people to entirely own their data. Users can complete their profile as they want and then earn money by renting their profile to brands.

Second, companies should determine whether they should **disclose their data projects to promote open access to information** for the social economy. They can release non-strategic data to the ecosystem and provide open data sets to support open innovation. This

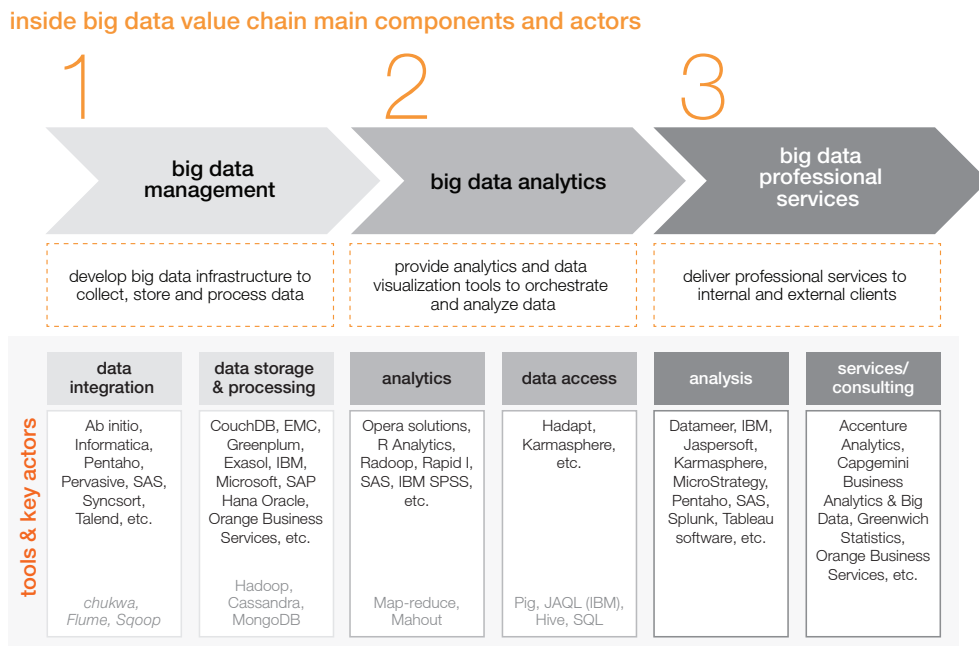
could have a direct impact on their brand image in terms of social responsibility and innovation. In addition, opening their data might enable them to gather more information from other data providers (within a win-win collection system). State and public organizations are currently doing the same thing. They enable other private actors (i.e., developers) to use and transform their sets of data (which are anonymized, non-critical and non-strategic for defense security) on citizens, public services, equipment and environment for their own activity. This eventually

contributes to fostering open innovation and provides new types of services for citizens who are looking for more useful and customized services (e.g., average 823,000 requests per month on public facilities location in France in 2012).

1. select the right technological solutions to support your data strategy with your partners

Third, corporations definitely need to identify the right technology and the right partner for the completion of their big data

strategy (shifting from their IT infrastructure to the delivery of analytical and business services). Pure players, from the Web (Amazon, Google and Facebook) or from the ICT industry (IBM, Alcatel Lucent, HP, Orange Business Services, etc.), can provide a large range of data management solutions that can sometimes be based on cloud models or use specific database and software solutions (NoSQL, New SQL, Hadoop, etc.). Companies can either select open source or proprietary solutions; it depends on enterprise mindset and strategy.



source: Orange Consulting

Since the data market is not yet mature and is constantly evolving, ICT actors intend to provide flexible and customizable services to suit the needs of clients (i.e., interact with internal and external databases more easily). Today they are challenged by start-ups, who can more rapidly provide specific support on big data IT architecture and services. Two

strategies can be envisioned, an external growth strategy (1) or building partnerships (2):

1. acquisition of start-ups to develop companies' internal big data structure
2. collaboration with start-ups or development of partnerships on big data streams or projects

In short, companies will have to collaborate with other actors (i.e., customers, public organizations and ICT actors) and work with their ecosystem to launch their big data project.

C. data stakeholders can leverage their data and generate (direct or indirect) revenues by launching big data projects

It is easier for ICT actors selling data processing and storage services to generate revenues from big data while it is more complicated for others who might not have the appropriate skills. These types of organizations include: public institutions opening their data to improve the wealth of the social economy, customers giving their data to enjoy better customized services and

companies analyzing their own data to increase productivity.

1. understand transactional flows between actors

The graph below sums up the **relationship between each actor** and tries to give an up-to-date overview of **existing data flows**.

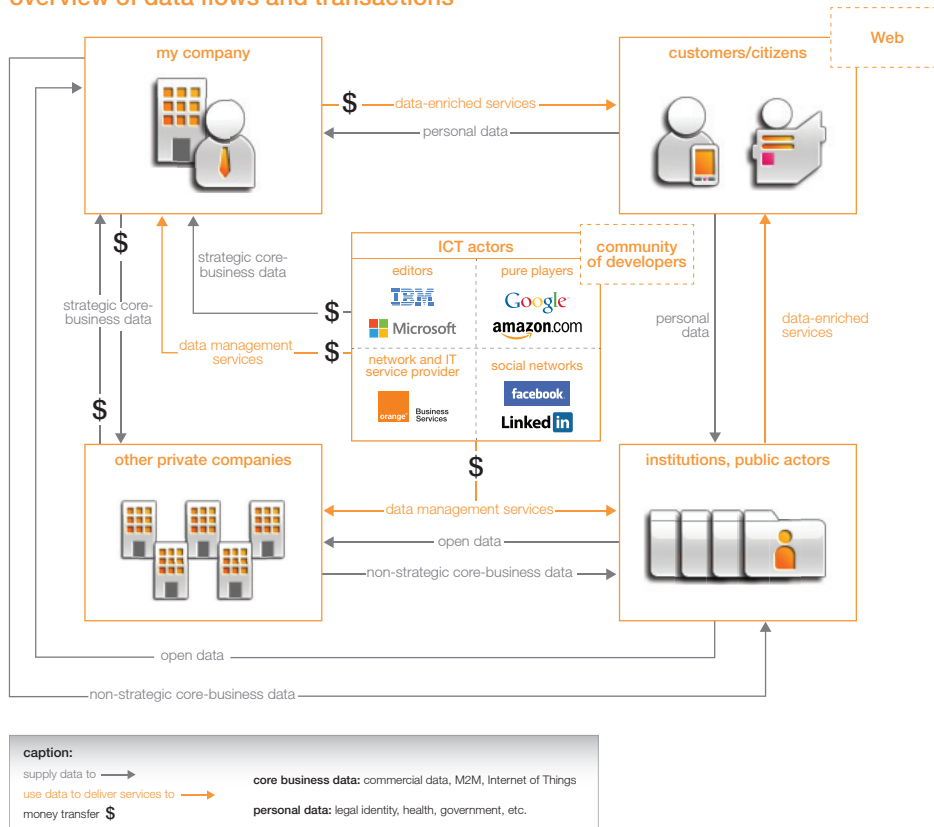
In many ways, advantages procured by pervasive data are valuable for the economy. Each actor can benefit from the data movement and successfully navigate

in this challenging environment.

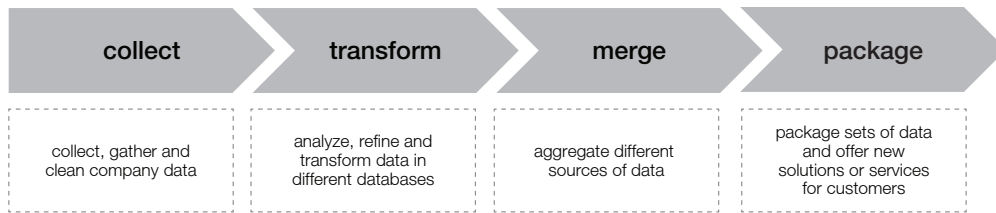
2. provide data-enriched services

Let's take the example of a company trying to leverage its own data as well as data from its customers and its ecosystem. In its ecosystem, ICT actors play a key role because they eventually enable one company to clean, transform, merge and package its data. This data cycle enables them to treat data and sell it to clients or properly use it internally to optimize its business. Raw data (with no added value) is seldom strategic for

overview of data flows and transactions



data cycle



source: Orange Consulting

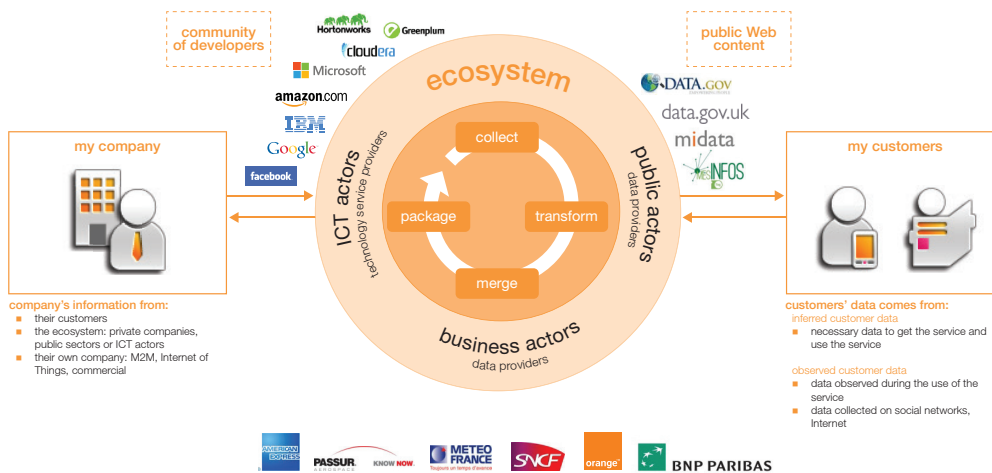
one company and cannot be sold at a premium price, therefore all the value lies in the **success of each stage of the data cycle**. The graph called “data cycle” describes the data cycle a company could encounter to provide the right data-

enriched services to its clients or to fulfill its internal needs.

All the interactions previously described with customers, public institutions, ICT actors and other private companies

highlight the challenges a company has to deal with to leverage the promise of big data.

big data ecosystem



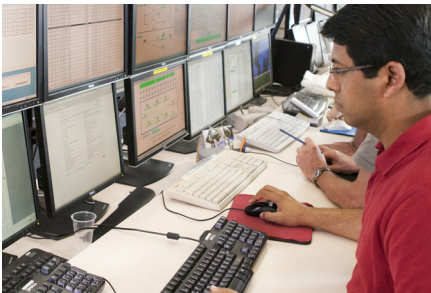
source: Orange Consulting

highlights

In light of this ecosystem, it is still possible for companies to develop their own big data structures internally or externally. Companies must define their big data strategies depending on their sector, internal assets, client profiles and market position. This can be time consuming depending on the ability of one company to allocate resources to the project. Companies should therefore start with small and pragmatic big data projects.

Despite this complex ecosystem, companies need to realize that investing in big data is very strategic. Ignoring big data could prove to be detrimental in the future and could make them vulnerable to competition.

analyze data to create business value and seize big data opportunities



As explained before, companies must build their data strategy while taking into account various elements such as their capabilities, ecosystem and business challenges. They must define specific objectives to assess what kind of data they can collect and analyze in order to determine its value. Overall, companies mainly invest in big data analytics to develop their sales (15.2%) and improve their marketing (15%) and customer service (13.3%)³. There are different ways for companies to make profits from big data. As illustrated in the graph below, they are classified into four different categories. Firms can optimize their assets, expand their knowledge of their customers and ecosystem, and improve or develop new services. All of this should enable their company to develop a better business strategy and positioning.

A. develop performance indicators and manage complex events by optimizing and streamlining company assets and processes

Companies can collect, store and analyze data to **build indicators and events in order to optimize their company assets**. This should enable them to improve the allocation of their resources and optimize their processes.

1. use analytics to fully grasp big data potential

Three different analytical techniques are currently used to fully grasp big data potential:

- **basic analytics** with standard reporting and scorecards to have a snapshot of your company and its current processes

benefits of developing your company data strategy



source: Orange Consulting

³Big Data investments per business function (2013), percentage of companies' total investments in Big Data in 2012, Tata Consultancy Services

- **anticipatory analytics** with segmentation, statistical or sensitivity analysis to create future performance drivers
- **predictive analytics** with predictive modeling and simulation to get dynamic insights and forecasts

These techniques can either be utilized in real-time or batch mode. Companies are increasingly using **real-time analytics** to prevent unfortunate events from happening such as fraud detection or piracy.

2. process complex events in real time to optimize daily operations

Complex event processing aims to screen many events in one organization, identifying the most meaningful ones, analyzing potential consequences and managing all events in real time. This method enables companies to **react quickly to any threat or piracy** and to optimize companies' daily operations as well as the quality of services. For instance, fraud can be better tackled with the emergence of new fraud and risk analytical tools based on complex event

processing techniques. Real-time fraud detection can be used by banks to insure their customers against identity theft at automated teller machines (ATMs).

In order to better use their data, firms can define key performance indicators (KPIs) to challenge their departments and enhance their productivity. In short, if companies manage to build efficient analytics, it will help them to improve their processes (with a better understanding of their businesses and ecosystems) and eventually reduce costs.

3. reduce your total cost of ownership by using advanced data management tools

Once a company better understands its data, it must manage and monitor it. Nowadays, companies can drastically reduce their IT infrastructure total cost of ownership thanks to the following tools:

1. new data management solutions (higher computing power to deal with data volume and velocity, etc.)
2. lower storage prices (decreasing price of data centers, free software, etc.)

3. cloud solutions (easier and quicker access to data based on an "as a service" model)

Storage capacity has increased while prices have decreased with the arrival of new big data management solutions. Hadoop and NoSQL significantly increased the amount of data companies can store and process. Cloud-based platforms for big data solutions also enable companies to optimize their cost structure and facilitate data access through an "as a service" model.

Even though these solutions are still new to the market, this should allow companies to get higher price-performance ratios. The costs for these solutions are rather low compared to proprietary solutions; however, implementing these cost-effective solutions will generate hidden costs that should not be underestimated, such as loading costs, maintenance, training and technology versioning.

PASSUR Aerospace is an excellent example of how one company can achieve cost savings by processing external and internal data.



use big data to streamline your processes and achieve cost savings

In 2011, PASSUR Aerospace launched a new service for airline companies and airports, a suite of tools based on internal and external data that automatically predicts airplanes' expected arrival times. This basic service can significantly decrease costs for airline companies and improve internal processes (there is a penalty fee for late arrival at an airport).

This service is based on intensive data exploitation by combining and analyzing data in real time to predict a relevant aircraft's arrival time. Passur first gathers various public data sets such as local weather or airplane schedules in addition to collecting data from their own network, composed of passive radars next to airports. These radars relay data in real time on air traffic on any aircraft that is flying in the local area. Last but not least, they use the data given by pilots on the estimated arrival time to refine their forecasts.

As a result, airline companies can more accurately predict aircrafts' arrival times, and therefore cut costs (airports only charge them if they land after the scheduled time). They can also optimize their internal processes since they get information in real time and better manage their logistics.

B. with a better understanding of their ecosystems, enterprises can more easily seize business opportunities and collaborate with the right partners

Companies can also use content from the Web and from their clients (i.e., user-generated content and observed data on clients' behaviors) and transform this unstructured data into actionable enterprise intelligence. Today analytics software is still improving to deliver more reliable information in the future based on an ever growing volume of real-time and automatically processed data.

1. compare and benchmark your company within its ecosystem

Gathering a variety of information on competitors (e.g., marketing and finance) gives companies some insights on their competitors' competencies and helps

them fine-tune their business strategies with a better knowledge of business opportunities and changes. They can, for instance, be proactive by acting before their competitors and be more reactive to any environmental change or disruption.

For instance, one large European fast food chain reacted quickly to an unexpected event by meticulously analyzing external data with the help of business analytics software. In 2011, a boy died from food poisoning after eating two contaminated burgers. Immediately, the story was leaked to the press and the Internet without any official medical report, which left the company to face a severe sanitation and brand image crisis. They decided to use sensitive analytical techniques based on hot words and snippets found on the Internet (i.e., social networks, blogs and online newspapers). They were able to assess consumer feelings and compare their response

to that of competitors during similar crises. The analysis also pinpointed that a French newspaper, "La Provence" was particularly commented on by social network users. Consequently, the company communicated in this newspaper to maximize its audience. Being aware of consumer demand based on big data analytics, the company was able to adapt its PR strategy. One month later, it launched a website dedicated to the sanitary commitment of its fast food restaurants and it created a quality label that preserved its market share and positioning.

2. find the right partners with big data

Companies can build the right partnerships or strategic alliances with big data analytics since it will help them have a clear vision of the ecosystem and do a scoring of all key players in their industries.

For example, a leading French wine and spirits company planned to expand its business to the U.S. by buying or merging with an American company. Using business analytic software, they screened hot words related to rum and whiskey on the Internet (i.e., social networks, blogs and forums) to build their opportunity studies. It enabled them to identify the most popular American spirits companies regarding various criteria such as the taste of their liquor or their reputation. Thanks to hot word sensitivity analysis, they were able to build an accurate marketing strategy and thus select

companies that best matched their brand image.

3. leverage brand equity

Furthermore, companies can use the information they collected from their ecosystem (i.e., open source data) to leverage their brand equity. Nike created Nike responsibility, an open data project, **to promote greater transparency and reinforce its brand image**. Whereas it was often criticized about employees' poor working conditions, low wages and its products' environmental impact

in Asia, with this project, Nike reveals the environmental impact of its products and provides data on its manufacturers (i.e., evaluation and audit reports of its subcontractors).

All of these benefits should enable companies to react quickly to any disruption, team up with the right partner, raise their brand equity and help them seize business opportunities. Vestas is a good use case of how implementing a data strategy can enable one company to build a competitive advantage.



use data from your ecosystem to always be a step ahead of your competitors

Vestas Wind Systems, a Danish firm specialized in energy, used internal and external data to significantly improve the **placement of its wind turbines** and identify new markets for wind energy.

Vestas used IBM Big Data analytics software (IBM BigInsights software) as well as the IBM "Firestorm" supercomputer to analyze petaoctets⁴ of **unstructured data** linked to wind energy: weather reports, moon phases, ebb and flows, geospatial data, data issued from sensors and satellite images.

They ran IBM BigInsights (which is powered by the open source technology Apache Hadoop) on 1,222 connected, "workload optimized System x iDataPlex servers that make up Firestorm and are capable of 150 trillion calculations per second – equivalent to 30 million calculations per Danish citizen per second⁵."

This analysis, which used to take weeks, is now done **in less than one hour** and enabled them to identify the best spot for its wind turbines before its competitors. Lars Christian Christensen, Vice President of Plant Siting and Forecasting at Vestas, claimed that "using IBM software and systems (etc.) [helped them] **identify new markets** for wind energy and helped clients meet aggressive renewable energy goals."

⁴1 petaoctet = 1,000,000 gigaoctet

⁵IBM Website (October 2011), <http://www-03.ibm.com/press/us/en/pressrelease/35737.wss>

C. companies can expand their knowledge of customer behavior, perception and preference in order to propose tailored services to their clients

In today's highly competitive world of business, companies can only ensure staying ahead of the competition by delivering the right service at the right time to the right person.

1. expand your knowledge of customers by profiling customers

Data exploitation can lead to a **better and deeper understanding of customer behavior** via the combination of internal (i.e., CRM) and external data (i.e., social networks data, websites visits, etc.). Firms can personalize their offers depending on client profiles and preferences. By crossing data, firms can obtain a wider and more accurate view of customer behaviors, preferences and perceptions of their organization, services or products. They can **refine customer segmentations**, design models to determine current trends, **predict future behaviors**, and, as a result, adapt products accordingly to customer analytics.

ICT actors such as Google can now get **very detailed profiles on their customers** by knowing exactly what they are doing on the net, what they are buying and what kind of newspapers they are reading. They are now providing cloud solutions and are trying to enhance their offers by providing specific spaces for each profile they may have:

- professional profile: all emails or notifications they can get from professional social networks (i.e., LinkedIn), job offers and demands, returns on experience, business card suppliers, etc.
- personal profile: legal and public information, identity documents, personal emails, Facebook notifications, blogs, etc.
- commercial profile: all newsletters they receive from their favorite brands, all private sales invitations, loyalty card points/offers, etc.

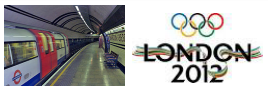
2. deliver the right service at the right time to the right person

By correctly completing their profile, Google users could receive **customized offers or information** from retailers they selected:

- professional profile: accept offers for any consulting job on LinkedIn or software solutions from Microsoft
- personal profile: receive indicators and dashboards on their activity and receive specific offers such as storage facilities
- commercial profile: get offers that correspond to your body size (e.g., only medium clothes and size 12 boots)

Companies can also propose **profiling services** by providing personal assistants on their websites (customized websites based on client accounts) or personalizing their offers.

All in all, the knowledge extracted from data exploitation should enable companies to customize their offers and, as a result, **reduce churn risk, increase up-/cross-sells and foster better business decision making**. Several sectors are well-positioned on data exploitation, especially in the transport sector. An example is the traffic update desk in London that is now offering news services by exploiting multi-sets of data in real time.



real-time management of multiple data sets to optimize transport offer

London, one of the most congested cities in the world, uses technology to regulate traffic, identify smugglers and make sure that drivers pay the London congestion charge. The traffic update desk demonstrated its efficient traffic management during the Olympic Games where it had to manage millions of additional drivers, public transport users, etc.

To avoid tube congestion, the traffic update desk and the authorities collected data from social networks, security cameras and automatic traffic surveillance systems and combined it with weather, police and network carrier content. It enabled them to **predict peak hour traffic** and find solutions to **regulate traffic flows**.

They were, for example, always providing updated news to the media, citizens, service providers and athletes. Monitoring data in real time is the key to success for traffic management since firms can react quickly to any incident or event and design appropriate coordination measures for traffic management and operational plans. Knowing traveler behaviors enabled the traffic update desk to successfully adapt and continue to provide its services in line with traveler expectations.

D. enterprises can directly handover their data or develop new business services to boost their revenues

Data exploitation helps support a diversification and a business growth strategy. Most of the raw data owned by enterprises could be re-used or integrated into their database to build new products or services. Tapping into customer data enables companies to **create additional revenues by directly handing over their data and developing new business services**.

1. sell raw data or data sets

Many private firms and public actors are riding the open data wave by opening some of their sets of data (raw or structured) to third parties such as

developers. By offering data to citizens or customers, they help foster the social economy and improve customer experiences. Most of the time, sets of data are available via application programming interfaces (APIs) that can either be free or purchased (e.g., monthly fee or annual fee). Opening their data is a way for companies to create additional revenue by exchanging data with other companies. This open innovation initiative is a smart way to build a win-win strategy with selected partners. They also need to keep in mind that they could capture more value by developing a service. Indeed the revenue they can earn by selling raw data or basic data sets to data providers is **low compared to the benefits they could get by selling analytics or reports** to other companies. Since other companies will share their data at no cost, companies will seldom pay for raw

data. Companies should therefore try to add value and provide data services such as reports, panel discussions or profiling to other companies.

2. launch new services linked to data

Companies could also do some **cross-selling or up-selling by launching new services based on data**. These services can either be linked or completely cut off from their core business. Any company dealing with ICT could provide, in addition to analytics and data management solutions, the infrastructure that goes with it. Firms are ready **to pay a fair price to get access to indicators or reports** and this would require having access to a big data platform. As an example, banks could create value for both B2C and B2B customers by mediating interactions and providing a market place to enable

customers to access a Web platform with customized offers from all types of retailers (e.g., car dealers or travel agents). In this case, banks act as a trustworthy partner by ensuring retailers' reliability and offering an ultra-safe platform.

3. think big, start small

All of this reveals that companies need to position themselves on big data

and build core competencies on data analysis and management to **remain competitive** in their industry. They need to make strategic moves and focus their investment on specific business needs (i.e., customer services, marketing and operations). Extracting value from big data is a long-term process, often without a short-term return on investment. It is for this reason that companies need to start small so as to experiment with big data in a **scalable and agile manner**. This test-

and-learn mindset will give companies a better understanding of their markets and assets and shorten the ROI.

American Express is an example of how companies can boost their revenue by building a new branch to tackle issues related to data and address new markets.

AMERICAN EXPRESS BUSINESS INSIGHTS

customer insights and consulting through exploitation of transactional data

American Express has launched an analytics and consulting organization, called American Express Business Insights, to help its business customers develop better-informed strategies. **The new unit will study the aggregate trend analysis and spending patterns** of approximately 90 million cards across 127 markets to provide business planning and marketing expertise. Business Insights will be able to identify consumer spending trends, consult on customer acquisition and retention, develop marketing and advertising strategies and improve CRM and procurement processes according to the company statement.

All data is gathered on an aggregate level, **in keeping with the company's privacy practices**, so it does not disclose any personally identifiable information to merchants or partners for marketing purposes. Essentially, the pooled transactional data can be used to create consumer segments like "ultra-affluent" or "large corporate" to evaluate purchasing patterns within a business. This new service, out of the American Express core business, competes with companies that are key players in analysis in consumer behavior: Kantar, Ipsos, BVA and Nielsen. Re-using data in a strategic way can foster competition, **allow new actors to enter the market and rebalance the ecosystem**.

highlights

In short, companies should implement a pragmatic data strategy to benefit from big data opportunities. The four benefits explored aim at boosting companies' businesses thanks to a better positioning and business strategy:



Extracting value from big data is nevertheless rather complex and requires having a good understanding and vision of the potential challenges that might be encountered.

recognize and mitigate potential challenges



Corporations can exploit big data opportunities inside and outside the organization through start-small, cost-effective analytics and pattern-

recognition tools and techniques. But first, they need to be aware of all the risk factors: business, operational, technological and legal challenges.

main challenges for extracting business value from big data



business challenges

- design a viable business model and define the potential return on investment
- find a relevant competitive positioning and build your business plan
- determine your solution and infrastructure cost



operational challenges

- develop a new operating model: decentralized, standalone, etc.
- drive internal culture towards data sharing and trust
- attract and retain the right talent (e.g. data science team)



technological challenges

- define the appropriate infrastructure for your business
- select a big data solution that can evolve with time: NoSQL, BI, analytics, etc.
- consider opening your data sets and implementing API interface



legal challenges

- anticipate new regulation impacts on data collection, crossing and treatment
- do not underestimate user empowerment in your big data strategy
- build a trusting relationship with clients by offering more transparency

source: Orange Consulting

A. business challenges: find the right positioning in the data value chain and extract the most value from big data projects and services

Designing a viable business model⁶ is a real challenge and an ongoing task especially in today's big data world. Big data drives new business models, go-to-market strategies and at the same time, reinvents tried-and-true ways of interacting with partners and clients.

1. deliver a compelling customer value proposition

Firms must figure out what business model could deliver a **compelling customer value proposition** and capture significant value from their innovations. They need to understand their customer or prospect behaviors and (changing) needs, their cost and revenue structures, as well as their competitors' positioning and strategies. Furthermore, they must "question their company": Where can big data create a competitive advantage for their company? How can they capture benefits from big data and analytics? **How far can big data transform their value creation process?**

⁶Whenever one company establishes its business, it employs a specific business model that embodies its organizational and financial "architecture." Value creation is at the heart of its business model – it actually explains the business logic needed to make a profit and, once applied, describes the enterprise "go-to-market strategy."

Making the most out of big data requires some investments that should, in the long run, either convert into savings (i.e., process optimization) or revenues. Companies that own data can explore the possibility of monetizing it and the ones that can provide data-driven insights can monetize this core competency.

New business models have already emerged and they will continue to evolve. Because corporations must quickly respond to market changes, **flexible and agile business models** should be put in place to adapt to big data imperatives.

A new model could be the shifting of the cost of service personalization from the company to its customers. Customers could pay a higher price to create and manage their own services. For instance, they could customize their yogurt flavor or their packaging on the brand website and have home delivery. Other basic models could also be revised. One could imagine a strategic alliance or partnership between retailers and a bank or telecommunications operator to bill consumers. Telcos or banks (acting as trustworthy partners) could centralize, with billing through mobile phone or

credit card invoices, the cash generated by one service and redistribute it to all retailers involved.

In short, **two main go-to-market strategies** can be singled out: companies can either choose to go on their own if they have all the required assets (IT, people, valuable data, financial, etc.) or develop strong partnerships. Indeed in a big data environment, companies need to **combine data, skills and resources** to launch relevant big data services and achieve a win-win strategy.

examples of go-to-market strategies



source: Orange Consulting

2. select a go-to-market strategy: go on your own or with a partner(s)

The complexity of the big data ecosystem will certainly foster **multiple alliances and partnerships**. Companies should have no interest in creating an exclusive partnership since the market is still evolving. Rather, they should manage their partnerships and at the same time ensure they are well positioned to strengthen their presence across the value chain. This is, however, only possible for a small number of companies.

In short, once one company has built its business model and estimated how much profit it can make, it needs to

convince the top management to invest in its project: **demonstrate its feasibility and short-term ROI** by using low-cost or open-source tools, defining the right resources (i.e., people) and business model. Setting up analytics or developing new products will pose a new set of challenges – financial and operational – and impact critical dimensions of the organization: business, culture, talent and technology.

B. operational and organizational challenges: select the right organization that showcases your talents and fosters data sharing

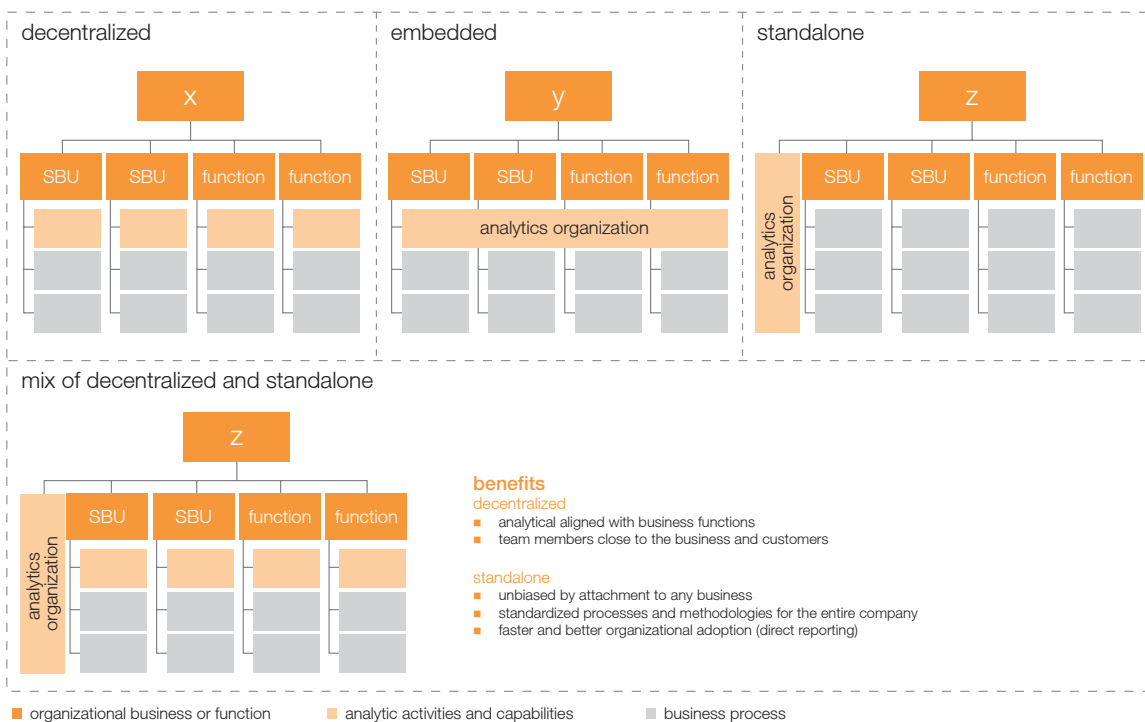
Big data radically changes **enterprise structure** by putting the customer at

the heart of its business. It disrupts traditional information architectures – with a shift from data warehousing (e.g., data storage) to data pooling (e.g., information shareability). As a result, firms must **adopt a new operating model** that “supports” big data: three organization models, decentralized services, embedded shared services and standalone shared services stand out.

1. adopt an operating model that supports big data

Companies should give careful consideration to the positioning of their organizations since it will impact strategic planning, the speed of execution and decision making, as well as the reactivity

big data organizational model



source: Orange Consulting

of the entire organization. In most cases, the most efficient operating model is a blend of decentralized services for business intelligence and standalone shared services for analytics. This always depends on the industry and the company capabilities. Organizations with business intelligence embedded within business units can develop specific performance indicators, hypothesis based and data driven decision making. In addition they can get a view of the entire business and the opportunities to pursue for the company by getting a centralized and independent function for analytics.

2. encourage cross-team data sharing and breaking silo-centric behaviors

The structure of the company will also help drive the organizational culture towards data sharing. As illustrated above, companies are split into divisions, departments or groups such as finance and procurement in order

to build expertise in different areas. This often creates organizational silos where one department controls the flow of information and prevents its access. But, to achieve success with big data, leaders need to break down silo-centric behaviors and force more cross-team data sharing. Appointing a strong sponsor can be an efficient way to federate all big data teams and avoid disagreements and conflicts between departments. They could also address these cultural challenges by providing the right incentives and/or metrics to promote collaboration and improve trust. For instance, they could identify cultural barriers to data sharing and prepare mitigation strategies and communications that overcome perceived obstacles. In 2010, Orange developed an enterprise social network, Piazza, to foster data sharing between employees. It helped overcome business silos by providing the right data and contact on one specific subject.

3. attract and retain the right talent

With a new structure, positive internal culture and attractive salary packages, companies should be able to attract and retain the right talent. Big data has introduced new interdisciplinary roles whose scope and set of skills should be clearly defined and visible:

1. technology specialists who manage tools and administrate platforms
2. technical and data science specialists who analyze, combine and monitor big data sets (the data scientist is the most sought-after talent with advanced statistical and mathematical knowledge combined with business knowledge)
3. business managers who understand their clients' data challenges and provide them advice

main resources and competencies required for the management of the data cycle

challenges	technical			operational & business		legal
data experts	administrators	developers	data science team	business managers	project managers	solicitors
their actions on the data cycle: 1. collect 2. transform 3. merge 4. package	platform and database administration	open source or proprietary software selection (e.g. ETL)	data interpretation and visualization: business knowledge	sales and business development	coordination of technical and business teams	international and local business law
	technical modifications	model and code selection (e.g. Hadoop, NoSQL)	data enrichment: mathematical tools, business intelligence, econometrics and statistics	customer relationship management	project delivery: resource and project planning and budget follow-ups	protection and privacy laws (e.g. data collection and anonymization)
	infrastructure optimization and tuning	language selection (e.g. R, C++, java)	data transformation and analysis: data mining	competitive and business intelligence		
	incident and fault management	software development and tuning (e.g. algorithm creation)	data crunchers	communication on the company data initiatives and projects	identification of potential synergies between big data projects	
	security and maintenance		data collection and integration			

source: Orange Consulting

Overall, companies should assess resource needs and write a resource planning report that highlights the best tools, skills and techniques. It will help organizations understand how they can analyze complex data sets and design big data solutions. In addition, it should enable the chief human resources officer to fine-tune the HR strategy and retain “data” talents that are a **scarce resource** in the current market. The difficulty remains in selecting the right technological tools depending on your talents’ capabilities and your business needs.

C. technological challenges: define the right technological investment (make, buy or outsource) depending on your company’s long-term big data plan

Selecting the right technological tools is a major issue for companies. It currently poses a **new array of challenges** in terms of (1) data quality; (2) data characterization; (3) data interpretation and (4) data visualization.

1. **data quality:** select the right data management tool to put aside useless data and focus on getting consistent data sets. Since data accumulates over time, new settings must be defined to ensure the quality of data
2. **data characterization:** recruit a data scientist and choose the right data management tool to “flag” your data and organize your storage. To do so, companies first need to assess how much and what type of data they have, and second, how it might evolve. Data constantly changes: its volume, velocity, variety and variability. Firms must take this into consideration not to miss out on great opportunities
3. **data analysis and interpretation:** buy the right software and hire trained specialists with sufficient knowledge of your business to analyze data. Software developers today can design filters and pattern recognizers that can analyze tons of data and find interesting insights in one domain. The data science team can use their business knowledge afterwards to refine the patterns pre-identified
4. **data visualization:** find the right person (i.e business intelligence analyst) and tools to represent results in a comprehensive way for business entities. This is a very difficult task since it requires a critical and deep understanding of human cognition because, without proper representation, data could be useless

1. select the right tools and right resources for each step of the data cycle

With the emergence of **NoSQL models** from Web actors (Yahoo and then Google, Amazon, etc.) and **cloud computing solutions**, the possibilities are increasing for companies to launch big data projects. Companies can treat, secure and easily access a huge volume of data in real time by selecting the right tools for each step of the data cycle: collect, transform, merge and package data.

Many analytical platforms are today available on the market; here is a brief

overview of the **big data technological landscape**:

big data technological landscape

database/platform	technology	description	vendor/product
relational databases	OLTP databases	<ul style="list-style-type: none"> support transaction processing applications two types of transactional RDBM systems: enterprise hubs and departmental marts 	Oracle, DB2, SQL server
analytic platforms	MPP analytical databases	<ul style="list-style-type: none"> replace MySQL or SQL server and provide superior price-performance for analytical workloads compared to transactional RDBM systems 	Teradata Active Data Warehouse, GreenPlum (EMC), Microsoft Parallel Data Warehouse, AsterData (Teradata), etc.
	columnar databases	<ul style="list-style-type: none"> serve as a replacement for most data warehouses or as a standalone analytical system for specific analytical workloads, such as delivering extremely fast performance or managing super large data volumes 	ParAccel, Infobright, SandTechnology, Sybase IQ (SAP), Vertica (HP), 1010data, Exasol, etc.
	analytical appliances		Nettez (IBM), Teradata appliances, Oracle Exadata, Greenplum Data computing compliance (EMC)
	analytical bundles		IBM Smart Analytics, Microsoft Fast Track
	in-memory databases		SAP Hana, Cognos TM1 (IBM), Membase, etc.
distributed file-based systems	Hadoop distributions	<ul style="list-style-type: none"> serve as a staging area and online archive for unstructured and semi-structured data use as an analytical system and more specifically an analytical sandbox for data scientists who query Hadoop files directly before the data is aggregated or loaded into the data warehouse 	Apache: Hadoop, Hive, Pig Proprietary Hadoop: Cloudera, MapR, IBM, Hortonworks
non-relational databases	NoSQL databases: key value	<ul style="list-style-type: none"> overcome the limitations of traditional RDBM systems to handle unstructured and semi-structured data doesn't require SQL to process data, although some support both SQL and non-SQL forms of data processing (i.e. graph system) 	Apache Hbase, Cassandra, Voldemort, BerkeleyDB
	NoSQL databases: document stores		Mongo DB, CouchBase, Raven DB
	NoSQL databases: SQL MapReduce		AsterData, EMC Greenplum
	NoSQL databases: graph systems		Neo4j, GraphDB, InfiniteGraph
	NoSQL databases: unified information access		Attivio, Marklogic Server, Splunk

source: Orange Consulting

Securing the increasing volume of data (which is doubling every 18 months⁷) is critical for companies. They need to find a way to **protect their valuable data** from hackers and to implement robust security systems to secure their big data solutions, frameworks, customer information (username, passwords, etc.) and intellectual property.

However, this implies that companies must have some internal resources dedicated for the treatment and

extraction of value-added data in a secure manner. At first, companies should **avoid outsourcing and keep these skills inside their company**. At the same time, this entirely depends on human resource availability. Three scenarios could be possible:

1. outsource the management of the data sets to an external company: full delegation of the data processing but with high security risk

2. buy the skills and technologies needed:

- buy “as a service” the necessary resources (i.e., storage, computing, analytics)
- buy a start-up specialized in big data and integrate it into the company’s organization

3. make it internally: development of the right technology and integration into the company’s information system

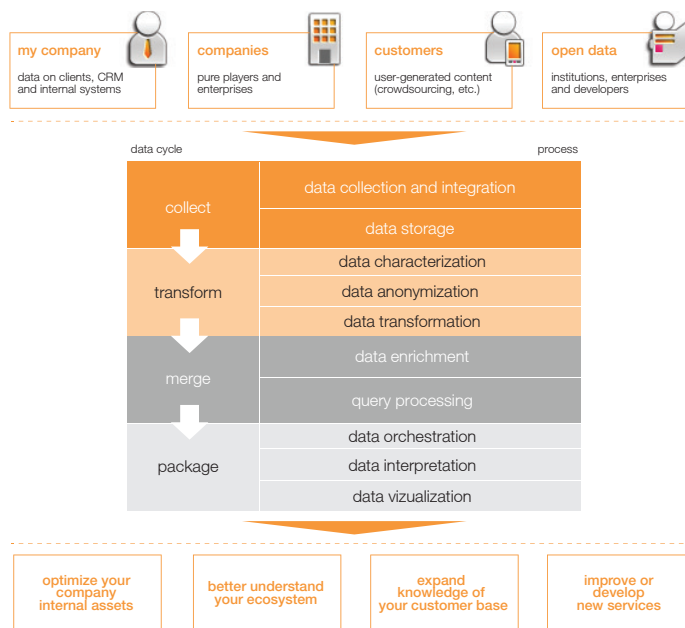
⁷CIO, 25 March 2013 http://www.cio.com/slideshow/detail/92712/10-Real-World-Big-Data-Deployments-That-Will-Change-Our-Lives?source=CIONLE_nlt_entapps_2013-04-01

From a financial point of view, this results in choosing between investing in big data as an internal service capacity – CAPEX⁸

oriented model for scenarios 2b and 3 – or using an on-demand external service capacity – OPEX⁹ oriented model for

scenarios 1 and 2a.

key technical processes in the data cycle



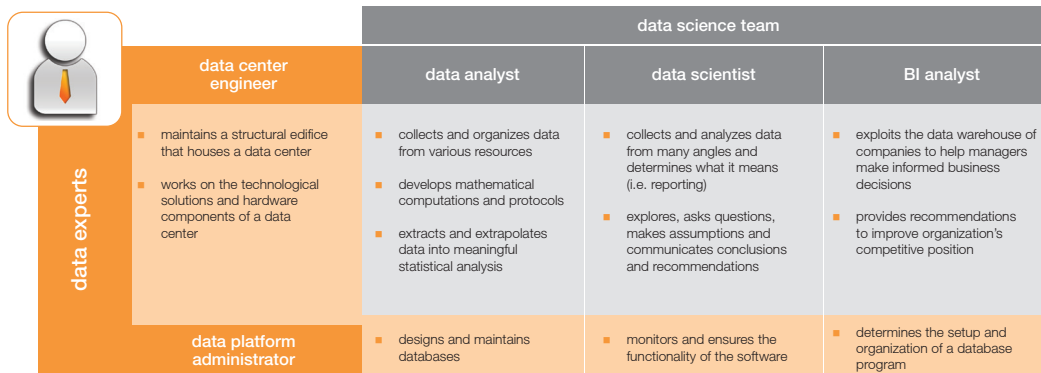
source: Orange Consulting

A team of data experts, either internalized or outsourced, can analyze and manage company data sets. This team, and more

specifically data scientists, should ensure that all data processes and critical steps

are performed well to meet company goals.

data experts team



source: Greenplum adapted by Orange Consulting

⁸CAPEX means CAPital Expenditures and a CAPEX model refers to the necessity to invest massively in assets before launching a business

⁹OPEX means OPERating Expenditures and an OPEX model is based on a scalable investment that increases with the number of customers

2. explore technology limits

Big data ICT actors such as Hortonworks, Cloudera, IBM or HP are now proposing open source or proprietary data management and analytics solutions to respond to growing company needs. These solutions should enable companies to master their data, combine them with external ones and extract all of the value. However, **today solution maturity is limited**. Even if big data solutions currently exist, most of the enterprise implementations are in the pilot stage. In the next few months, ICT actors should be able to **develop more powerful tools** that could easily interface with any system and access larger amounts of data with the cloud.

Beyond the technology itself, companies must **attract and retain the right talent** to manage these tools and their big data pragmatic projects (i.e., the database and platform administrator, developers and data science team). If they get the right technology and people, it should be easier to analyze and manage data. However, the first stage of the data cycle requires more than technology and people since it lies on customer

willingness to give information on their behaviors and perceptions. Firms must therefore think on **how they can get clients' consent** and entice them to consistently give more data.

D. legal challenges: rethink the legal framework for companies and customers to foster data sharing and transparency

People consciously share information on what they do, like, buy and dream. Sometimes they disclose all this digitally available information to companies without knowing it. A healthy and performing big data market could therefore emerge if legislation lays the groundwork for a new form of consent: informed and dynamic.

1. rethink privacy in an era of big data

“People give out their data often without thinking about it,” according to European Commission Vice President Viviane Reding. “They have no idea that it will be sold to third parties.”¹⁰ This information actually becomes money and has a real cost! European citizens' data was valued of €315 billion in 2011

according to new research conducted by Boston Consulting Group. This data has such value that some companies have engaged in unscrupulous business practices. The media has provided extensive coverage of data scandals and now users want to control their digital identity. Authorities need therefore to **rethink privacy in an era of big data and find the delicate balance between the right of the individual and the right to knowledge**.

In this context, the concept of “consent” is taking on a new role as both a user empowerment weapon and the new pillar of digital trust. Brussels is currently working on a new regulation that will **introduce new rights** such as data portability or digital oblivion. It will also provide greater deterrence by adapting the principle of extra-territoriality and reinforcing the penalty system (up to 2% of fraudulent companies' turnover). This should compel companies to adopt a **more proactive approach** to any request of explicit consent from a resident of the EU and also give users the ability to revoke their consent.

¹⁰ source: http://europa.eu/rapid/press-release_SPEECH-10-16_bg.htm

2. ensure trust with “dynamic” consent

In short, this reform puts users back at the heart of the data ecosystem, and consent could become one of the following in the coming years:

- selective: definition of the type of data, processing allowed and companies authorized to use it
- measured: protection settings

depending on customers’ uses/ usages

- renewed: monitoring of granted data sharing
- equipped: from a simple single opt-in to an interactive dashboard

Companies, as soon as possible, should take into account this new regulation when they think about their “data”

strategy and more specifically about consent. Today, exceptions allowed by the law enable companies (i.e., article 7 95/46 CE) to use data as they wish. But if they want to build a relationship based on trust with clients and therefore get more data from their clients, they should create a virtuous cycle of transparency to rebalance the ecosystem without losing the control.

legal framework proposed by the EU in 2013

new rules	
extra-territoriality	expand the scope of the regulation to any actor targeting/addressing residents from the EU; include international transfers
a strict definition of consent, that must be “explicit”	allow total control of people’s data by imposing a systematic and explicit consent, as well as more transparency
establishment of a single window in Brussels	facilitate the work of actors: one single law for all of Europe and one national data protection authority for every company
privacy by design	include data protection principles such as “data minimization” for the development of apps and services; for the account of the European data protection supervisor
stricter penalty regime/system	impose exemplary penalties up to 2% of companies’ turnover
new rights	
right to digital oblivion (article 17)	upon request, the data protection supervisor can erase all the company data on one individual and inform third parties that they have to do the same
data portability (article 18)	enables a person to extract his personal data from any application/service and give/transfer it to someone else

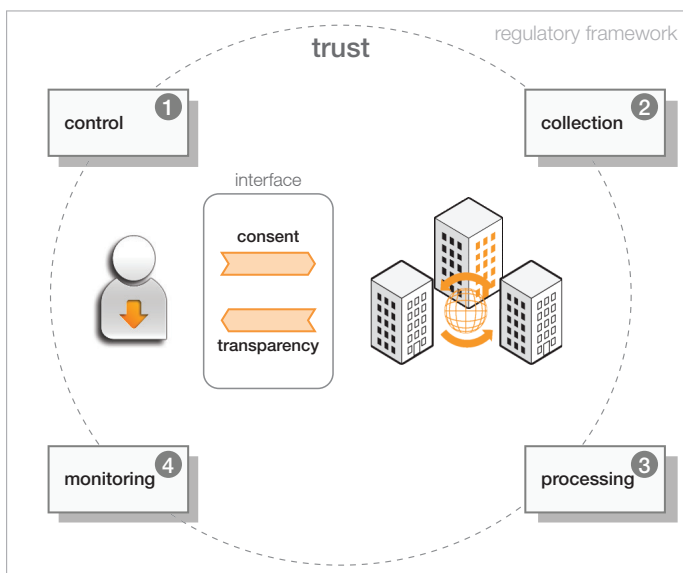
source: Orange Consulting

This virtuous cycle of transparency is based on a partnership approach,

company's willingness to always create more value for clients and their ability to

access data of high quality voluntarily shared by clients.

virtuous cycle between transparency and consent



source: Orange Consulting

- develop a **partnership-based approach** with authorities by being proactive on user empowerment questions/issues
- create value for clients by being positioned as a trust partner in a turbulent world
 - offer new services
 - propose remarkable customer service
- access data of better quality and given voluntarily by clients

highlights

If corporations manage to take into account each of these four challenges (business, operational, technological and legal), they should be able to acquire valuable data from their ecosystems, improve their brand image, develop their data positioning and always be a step ahead of the competition. They need to refine their business models and think thoroughly and pragmatically about how they want to build their big data projects and how they might evolve in the future.

conclusion



Companies can expect high revenues from big data if they manage to optimize their processes or build value-added services thanks to a better understanding of their clients and their big data ecosystems. To do so, they need to build **pragmatic data strategies** taking into account their industry specificities, resources and environments. Starting small with business-oriented projects is key to testing what types of impact big data could have within a company. Company leaders should support this strategy and also need **to consider the challenges they may encounter** to make sure their strategy is coherent with their business.

Marketing, finance and IT teams need to work closely together to select the right business model and go-to-market strategy to capture the maximum value. They also need to review their organization to gain flexibility and to build an internal culture that fosters data sharing and trust between employees. Companies need to attract and retain talent (i.e., the data scientist team) and select a data solution that can evolve. Last but not least, they need to be very carefully aligned with legislation to ensure the long-term viability of their big data project.

Here are **four key recommendations** to leverage big data within your company:

- 1. define the kind of data your company has and could have** that would help build valuable services or optimize your business cost structure
- 2. build strong partnerships to:**
 - **get a strong value proposition** and an **efficient go-to-market approach** for your big data project
 - **select cost-effective** data analytics/management **solutions** and the **right talents** to make the most out of these technologies
- 3. take into account regulation** on data privacy and more specifically on consent when thinking about data strategy
- 4. think on a long-term basis and start small** with realistic projects that will rapidly increase your ROI as well as your expertise on big data

about Orange Business Services

Orange Business Services, the Orange entity for business, is both a telecommunications operator and IT services company dedicated to businesses in France and around the world. Our 20,000 employees support companies, local government bodies and public sector organizations in every aspect of their digital transformation. This means we're at hand to orchestrate, operate and optimize: mobile and collaborative workspaces; IT and cloud infrastructures; connectivity (fixed and mobile networks, private and hybrid systems); applications for Internet of Things, 360° customer experience and big data analytics – as well as cybersecurity, thanks to our expertise in the protection of information systems and critical infrastructures. More than 2 million businesses in France and 3,000 multinationals place their trust in us. See why at: orange-business.com or follow us on Twitter [@orangebusiness](https://twitter.com/orangebusiness)

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