1 The Big Data Business Opportunity

Every now and then, new sources of data emerge that hold the potential to transform how organizations drive, or derive, business value. In the 1980s, we saw point-of-sale (POS) scanner data change the balance of power between consumer package goods (CPG) manufacturers like Procter & Gamble, Unilever, Frito Lay, and Kraft—and retailers like Walmart, Tesco, and Vons. The advent of detailed sources of data about product sales, soon coupled with customer loyalty data, provided retailers with unique insights about product sales, customer buying patterns, and overall market trends that previously were not available to any player in the CPG-to-retail value chain. The new data sources literally changed the business models of many companies.

Then in the late 1990s, web clicks became the new knowledge currency, enabling online merchants to gain significant competitive advantage over their brick-and-mortar counterparts. The detailed insights buried in the web logs gave online merchants new insights into product sales and customer purchase behaviors, and gave online retailers the ability to manipulate the user experience to influence (through capabilities like recommendation engines) customers' purchase choices and the contents of their electronic shopping carts. Again, companies had to change their business models to survive.

Today, we are in the midst of yet another data-driven business revolution. New sources of social media, mobile, and sensor or machine-generated data hold the potential to rewire an organization's value creation processes. Social media data provide insights into customer interests, passions, affiliations, and associations that can be used to optimize your customer engagement processes (from customer acquisition, activation, maturation, up-sell/cross-sell, retention, through advocacy development). Machine or sensor-generated data provide real-time data feeds at the most granular level of detail that enable predictive maintenance, product performance recommendations, and network optimization. In addition, mobile devices enable location-based insights and drive real-time customer engagement that allow

brick-and-mortar retailers to compete directly with online retailers in providing an improved, more engaging customer shopping experience.

The massive volumes (terabytes to petabytes), diversity, and complexity of the data are straining the capabilities of existing technology stacks. Traditional data warehouse and business intelligence architectures were not designed to handle petabytes of structured and unstructured data in real-time. This has resulted in the following challenges to both IT and business organizations:

- Rigid business intelligence, data warehouse, and data management architectures are impeding the business from identifying and exploiting fleeting, short-lived business opportunities.
- Retrospective reporting using aggregated data in batches can't leverage new analytic capabilities to develop predictive recommendations that guide business decisions.
- Social, mobile, or machine-generated data insights are not available in a timely manner in a world where the real-time customer experience is becoming the norm.
- Data aggregation and sampling destroys valuable nuances in the data that are key to uncovering new customer, product, operational, and market insights.

This blitz of new data has necessitated and driven technology innovation, much of it being powered by open source initiatives at digital media companies like Google (Big Table), Yahoo! (Hadoop), and Facebook (Hive and HBase), as well as universities (like Stanford, UC Irvine, and MIT). All of these big data developments hold the potential to paralyze businesses if they wait until the technology dust settles before moving forward. For those that wait, only bad things can happen:

- Competitors innovate more quickly and are able to realize compelling cost structure advantages.
- Profits and margins degenerate because competitors are able to identify, capture, and retain the most valuable customers.
- Market share declines result from not being able to get the right products to market at the right time for the right customers.
- Missed business opportunities occur because competitors have real-time listening devices rolling up real-time customer sentiment, product performance problems, and immediately-available monetization opportunities.

The time to move is now, because the risks of not moving can be devastating.

The Business Transformation Imperative

The big data movement is fueling a business transformation. Companies that are embracing big data as business transformational are moving from a retrospective, rearview mirror view of the business that uses partial slices of aggregated or sampled data in batch to monitor the business to a forward-looking, predictive view of operations that leverages all available data—including structured and unstructured data that may sit outside the four walls of the organization—in real-time to optimize business performance (see Table 1-1).

Table 1-1: Big data is about business transformation.

Today's Decision Making	Big Data Decision Making
"Rearview Mirror" hindsight	"Forward looking" recommendations
Less than 10% of available data	Exploit all data from diverse sources
Batch, incomplete, disjointed	Real-time, correlated, governed
Business Monitoring	Business Optimization

Think of this as the advent of the real-time, predictive enterprise!

In the end, it's all about the data. Insight-hungry organizations are liberating the data that is buried deep inside their transactional and operational systems, and integrating that data with data that resides outside the organization's four walls (such as social media, mobile, service providers, and publicly available data). These organizations are discovering that data—and the key insights buried inside the data—has the power to transform how organizations understand their customers, partners, suppliers, products, operations, and markets. In the process, leading organizations are transforming their thinking on data, transitioning from treating data as an operational cost to be minimized to a mentality that nurtures data as a strategic asset that needs to be acquired, cleansed, transformed, enriched, and analyzed to yield actionable insights. Bottom-line: companies are seeking ways to acquire even more data that they can leverage throughout the organization's value creation processes.

Walmart Case Study

Data can transform both companies and industries. Walmart is famous for their use of data to transform their business model.

> *The cornerstone of his [Sam Walton's] company's success ultimately lay in selling goods at the lowest possible price, something he was able to do by pushing aside the middlemen and directly haggling with manufacturers to bring costs down. The idea to "buy it low, stack it high, and sell it cheap" became a sustainable business model largely because Walton, at the behest of David Glass, his eventual successor,* **heavily invested in software that could track consumer behavior in real time from the bar codes read at Walmart's checkout counters.**
>
> *He shared the real-time data with suppliers to create partnerships that allowed Walmart to exert significant pressure on manufacturers to improve their productivity and become ever more efficient. As Walmart's influence grew, so did its power to nearly dictate the price, volume, delivery, packaging, and quality of many of its suppliers' products. The upshot: Walton flipped the supplier-retailer relationship upside down.*[1]

Walmart up-ended the balance of power in the CPG-to-retailer value chain. Before they had access to detailed POS scanner data, the CPG manufacturers (such as Procter & Gamble, Unilever, Kimberley Clark, and General Mills,) dictated to the retailers how much product they would be allowed to sell, at what prices, and using what promotions. But with access to customer insights that could be gleaned from POS data, the retailers were now in a position where they knew more about their customers' behaviors—what products they bought, what prices they were willing to pay, what promotions worked the most effectively, and what products they tended to buy in the same market basket. Add to this information the advent of the customer loyalty card, and the retailers knew in detail what products at what prices under what promotions appealed to which customers. Soon, the retailers were dictating terms to the CPG manufacturers—how much product they wanted to sell (demand-based forecasting), at what prices (yield and price optimization), and what promotions they wanted (promotional effectiveness). Some of these retailers even went one step further and figured out how to monetize their POS data by selling it back to the CPG manufacturers. For example, Walmart provides a data service to their CPG manufacturer partners, called Retail Link, which provides sales and inventory data on the manufacturer's products sold through Walmart.

Across almost all organizations, we are seeing multitudes of examples where data coupled with advanced analytics can transform key organizational business processes, such as:

[1] "The 12 greatest entrepreneurs of our time" Fortune/CNN Money (`http://money.cnn.com/galleries/2012/news/companies/1203/gallery.greatest-entrepreneurs.fortune/12.html`)

- **Procurement:** Identify which suppliers are most cost-effective in delivering products on-time and without damages.
- **Product Development:** Uncover product usage insights to speed product development processes and improve new product launch effectiveness.
- **Manufacturing:** Flag machinery and process variances that might be indicators of quality problems.
- **Distribution:** Quantify optimal inventory levels and optimize supply chain activities based on external factors such as weather, holidays, and economic conditions.
- **Marketing:** Identify which marketing promotions and campaigns are most effective in driving customer traffic, engagement, and sales, or use attribution analysis to optimize marketing mixes given marketing goals, customer behaviors, and channel behaviors.
- **Pricing and Yield Management:** Optimize prices for "perishable" goods such as groceries, airline seats, concert tickets and fashion merchandise.
- **Merchandising:** Optimize merchandise markdown based on current buying patterns, inventory levels, and product interest insights gleaned from social media data.
- **Sales:** Optimize sales resource assignments, product mix, commissions modeling, and account assignments.
- **Store Operations:** Optimize inventory levels given predicted buying patterns coupled with local demographic, weather, and events data.
- **Human Resources:** Identify the characteristics and behaviors of your most successful and effective employees.

The Big Data Business Model Maturity Index

Customers often ask me:

- How far can big data take us from a business perspective?
- What could the ultimate endpoint look like?
- How do I compare to others with respect to my organization's adoption of big data as a business enabler?
- How far can I push big data to power—or even transform—my value creation processes?

To help address these types of questions, I've created the Big Data Business Model Maturity Index. This index provides a benchmark against which organizations can

measure themselves as they look at what big data-enabled opportunities may lay ahead. Organizations can use this index to:

- Get an idea of where they stand with respect to exploiting big data and advanced analytics to power their value creation processes and business models (their current state).
- Identify where they want to be in the future (their desired state).

Organizations are moving at different paces with respect to how they are adopting big data and advanced analytics to create competitive advantages for themselves. Some organizations are moving very cautiously because they are unclear where and how to start, and which of the bevy of new technology innovations they need to deploy in order to start their big data journeys. Others are moving at a more aggressive pace to integrate big data and advanced analytics into their existing business processes in order to improve their organizational decision-making capabilities.

However, a select few are looking well beyond just improving their existing business processes with big data. These organizations are aggressively looking to identify and exploit new data monetization opportunities. That is, they are seeking out business opportunities where they can either sell their data (coupled with analytic insights) to others, integrate advanced analytics into their products to create "intelligent" products, or leverage the insights from big data to transform their customer relationships and customer experience.

Let's use the Big Data Business Model Maturity Index depicted in Figure 1-1 as a framework against which you can not only measure where your organization stands today, but also get some ideas on how far you can push the big data opportunity within your organization.

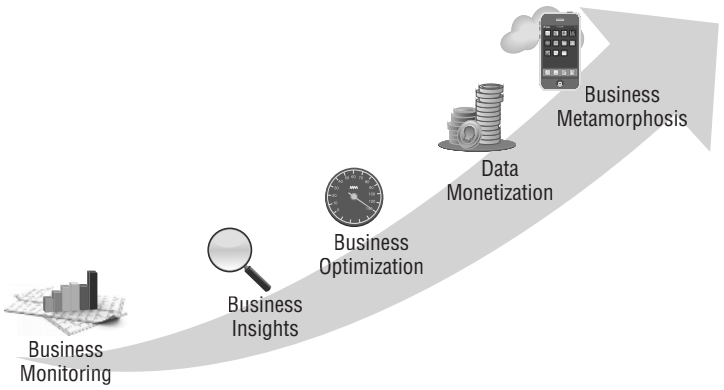

Figure 1-1: Big Data Business Model Maturity Index

Business Monitoring

In the *Business Monitoring* phase, you deploy Business Intelligence (BI) and traditional data warehouse capabilities to monitor, or report on, on-going business performance. Sometimes called *business performance management,* business monitoring uses basic analytics to flag under- or over-performing areas of the business, and automates sending alerts with pertinent information to concerned parties whenever such a situation occurs. The Business Monitoring phase leverages the following basic analytics to identify areas of the business requiring more investigation:

- Trending, such as time series, moving averages, or seasonality
- Comparisons to previous periods (weeks, months, etc.), events, or campaigns (for example, a back-to-school campaign)
- Benchmarks against previous periods, previous campaigns, and industry benchmarks
- Indices such as brand development, customer satisfaction, product performance, and financials
- Shares, such as market share, share of voice, and share of wallet

The Business Monitoring phase is a great starting point for your big data journey as you have already gone through the process—via your data warehousing and BI investments—of identifying your key business processes and capturing the KPIs, dimensions, metrics, reports, and dashboards that support those key business processes.

Business Insights

The *Business Insights* phase takes business monitoring to the next step by leveraging new unstructured data sources with advanced statistics, predictive analytics, and data mining, coupled with real-time data feeds, to identify material, significant, and actionable business insights that can be integrated into your key business processes. This phase looks to integrate those business insights back into the existing operational and management systems. Think of it as "intelligent" dashboards, where instead of just presenting tables of data and graphs, the application goes one step further to actually uncover material and relevant insights that are buried in the detailed data. The application can then make specific, actionable recommendations, calling out an observation on a particular area of the business where specific actions

can be taken to improve business performance. One client called this phase the "Tell me what I need to know" phase. Examples include:

- In marketing, uncovering observations that certain in-flight campaign activities or marketing treatments are more effective than others, coupled with specific recommendations as to how much marketing spend to shift to the more effective activities.
- In manufacturing, uncovering observations that certain production machines are operating outside of the bounds of their control charts (for example, upper limits or lower limits), coupled with a prioritized maintenance schedule with replacement part recommendations for each problem machine.
- In customer support, uncovering observations that certain gold card members' purchase and engagement activities have dropped below a certain threshold of normal activity, with a recommendation to e-mail them a discount coupon.

The following steps will transition your organization from the business monitoring to the business insights stage.

1. Invest the time to understand how users are using existing reports and dashboards to identify problems and opportunities. Check for situations where users are printing reports and making notes to the side of the reports. Find situations where users are downloading the reports into Excel or Access and capture what these users are doing with the data once they have it downloaded. Understanding what your users are doing with the existing reports and downloads is "gold" in identifying the areas where advanced analytics and real-time data can impact the business.
2. Understand how downstream constituents—those users that are the consumers of the analysis being done in Step 1—are using and making decisions based on the analysis. Ask, "What are these constituents doing with the results of the analysis? What actions are they trying to take? What decisions are they trying to make given the results of the analysis?"
3. Launch a prototype or pilot project that provides the opportunity to integrate detailed transactional data and new unstructured data sources with real-time data feeds and predictive analytics to automatically uncover potential problems and opportunities buried in the data (Insights), and generate actionable recommendations.

Business Optimization

The *Business Optimization* phase is the level of business maturity where organizations use embedded analytics to automatically optimize parts of their business operations. To many organizations, this is the Holy Grail where they can turn over certain parts of their business operations to analytic-powered applications that automatically optimize the selected business activities. Business optimization examples include:

- Marketing spend allocation based on in-flight campaign or promotion performance
- Resource scheduling based on purchase history, buying behaviors, and local weather and events
- Distribution and inventory optimization given current and predicted buying patterns, coupled with local demographic, weather, and events data
- Product pricing based on current buying patterns, inventory levels, and product interest insights gleaned from social media data
- Algorithmic trading in financial services

The following steps will transition your organization from the Business Insights phase to the Business Optimization phase:

1. The Business Insights phase resulted in a list of areas where you are already developing and delivering recommendations. Use this as the starting point in assembling the list of areas that are candidates for optimization. Evaluate these business insights recommendations based on the business or financial impact, feasibility of success, and their relative recommendation performance or effectiveness.
2. For each of the optimization candidates, identify the supporting business questions and decision-making process (the analytic process). You will also need to identify the required data sources and timing/latency of data feeds (depending on decision-making frequency and latency), the analytic modeling requirements, and the operational system and user experience requirements.
3. Finally, conduct "Proof of Value" or develop a prototype of your top optimization candidates to verify the business case, the financials (return on investment—ROI), and analytics performance.

You should also consider the creation of a formal analytics governance process that enables human subject matter experts to audit and evaluate the effectiveness and relevance of the resulting optimization models on a regular basis. As any good data scientist will tell you, the minute you build your analytic model it is obsolete due to changes in the real-world environment around it.

Data Monetization

The *Data Monetization* phase is where organizations are looking to leverage big data for net new revenue opportunities. While not an exhaustive list, this includes initiatives related to:

- Packaging customer, product, and marketing insights for sale to other organizations
- Integrating analytics directly into their products to create "intelligent" products
- Leveraging actionable insights and personalized recommendations based on customer behaviors and tendencies to upscale their customer relationships and dramatically rethink their "customer experience"

An example of the first type of initiative could be a smartphone app where data and insights about customer behaviors, product performance, and market trends are sold to marketers and manufacturers. For example, MapMyRun (`www.MapMyRun.com`) could package the customer usage insights from their smartphone application with audience and product insights for sale to sports apparel manufacturers, sporting goods retailers, insurance companies, and healthcare providers.

An example of the second type of initiative could be companies that leverage new big data sources (sensor data or user click/selection behaviors) with advanced analytics to create "intelligent" products, such as:

- Cars that learn your driving patterns and behaviors and use the data to adjust driver controls, seats, mirrors, brake pedals, dashboard displays, and other items to match your driving style.
- Televisions and DVRs that learn what types of shows and movies you like and use the data to search across the different cable channels to find and automatically record similar shows for you.
- Ovens that learn how you like certain foods cooked and uses the data to cook them in that manner automatically, and also include recommendations for other foods and cooking methods that others like you enjoy.

An example of the third type of initiative could be companies that leverage actionable insights and recommendations to "up-level" their customer relationships and dramatically rethink their customer's experience, such as:

- Small, medium business (SMB) merchant dashboards from online marketplaces that compare current and in-bound inventory levels with customer buying patterns to make merchandising and pricing recommendations
- Investor dashboards that assess investment goals, current income levels, and current financial portfolios to make specific asset allocation recommendations

The following steps will be useful in helping transition to the Data Monetization phase.

1. Identify your target customers and their desired solutions. Focus on identifying solutions that improve customers' business performance and help them make money. As part of that process, you will need to detail out the personas of the economic decision-makers. Invest time shadowing these decision-makers to understand what decisions they are trying to make, how frequently, and in what situations. Spend the time to gather details of what they are trying to accomplish, versus focusing on trying to understand what they are doing.
2. Inventory your current data assets. Capture what data you currently have. Also, identify what data you could have with a little more effort. This will require you to look at how the source data is being captured, to explore additional instrumentation strategies to capture even more data, and explore external sources of data that, when combined with your internal data, yields new insights on your customers, products, operations, and markets.
3. Determine the analytics, data enrichment, and data transformation processes necessary to transform your data assets into your targeted customers' desired solutions. This should include identifying:
    - The business questions and business decisions that your targeted personas are trying to ask and answer
    - The advanced analytics (algorithms, models), data augmentation, transformation, and enrichment processes necessary to create solutions that address your targeted persona's business questions and business decisions
    - Your targeted persona's user experience requirements, including their existing work environments and how you can leverage new mobile and data visualization capabilities to improve that user experience

Business Metamorphosis

The *Business Metamorphosis* phase is the ultimate goal for organizations that want to leverage the insights they are capturing about their customers' usage patterns, product performance behaviors, and overall market trends to transform their business models into new services in new markets. For example:

- Energy companies moving into the home energy optimization business by recommending when to replace appliances (based on predictive maintenance) and even recommending which brands to buy based on the performance of different appliances compared to customer usage patterns, local weather, and environmental conditions, such as local water conditions and energy costs.
- Farm equipment manufacturers transforming into farming optimization businesses by understanding crop performance given weather and soil conditions, and making seed, fertilizer, pesticide, and irrigation recommendations.
- Retailers moving into the shopping optimization business by recommending specific products given a customer's current buying patterns compared with others like them, including recommendations for products that may not even reside within their stores.
- Airlines moving into the "Travel Delight" business of not only offering discounts on air travel based on customers' travel behaviors and preferences, but also proactively finding and recommending deals on hotels, rental cars, limos, sporting or musical events, and local sites, shows, and shopping in the areas that they are visiting.

In order to make the move into the Business Metamorphosis phase, organizations need to think about moving away from a product-centric business model to a more platform- or ecosystem-centric business model.

Let's drill into this phase by starting with a history lesson. The North American video game console market was in a massive recession in 1985. Revenues that had peaked at $3.2 billion in 1983, fell to $100 million by 1985—a drop of almost 97 percent. The crash almost destroyed the then-fledgling industry and led to the bankruptcy of several companies, including Atari. Many business analysts doubted the long-term viability of the video game console industry.

There were several reasons for the crash. First, the hardware manufacturers had lost exclusive control of their platforms' supply of games, and consequently lost the ability to ensure that the toy stores were never overstocked with products. But the main culprit was the saturation of the market with low-quality games. Poor quality games, such as *Chase the Chuck Wagon* (about dogs eating food, bankrolled by the dog food company Purina), drove customers away from the industry.

The industry was revitalized in 1987 with the success of the Nintendo Entertainment System (NES). To ensure ecosystem success, Nintendo instituted strict measures to ensure high-quality games through licensing restrictions, maintained strict control of industry-wide game inventory, and implemented a security lockout system that only allowed certified games to work on the Nintendo platform. In the process, Nintendo ensured that third-party developers had a ready and profitable market.

As organizations contemplate the potential of big data to transform their business models, they need to start by understanding how they can leverage big data and the resulting analytic insights to transform the organization from a product-centric business model into a platform-centric business model. Much like the Nintendo lesson, you accomplish this by creating a marketplace that enables others—like app developers, partners, VARs, and third party solution providers—to make money off of your platform.

Let's build out the previous example of an energy company moving into the home energy optimization business. The company could capture home energy and appliance usage patterns that could be turned into insights and recommendations. For example, with the home energy usage information, the company could recommend when consumers should run their high energy appliances, like washers and dryers, to minimize energy costs. The energy company could go one step further and offer a service that automatically manages when the washer, dryer, and other high-energy appliances run—such as running the washer and dryer at 3:00 a.m. when energy prices are lower.

With all of the usage information, the company is also in a good position to predict when certain appliances might need maintenance (for example, monitoring their usage patterns using Six Sigma control charts to flag out-of-bounds performance problems). The energy company could make preventive maintenance recommendations to the homeowner, and even include the names of three to four local service dealers and their respective Yelp ratings.

But wait, there's more! With all of the product performance and maintenance data, the energy company is also in an ideal position to recommend which appliances are the best given the customer's usage patterns and local energy costs. They could become the *Consumer Reports* for appliances and other home and business equipment by recommending which brands to buy based on the performance of different appliances as compared to their customers' usage patterns, local weather, environmental conditions, and energy costs.

Finally, the energy company could package all of the product performance data and associated maintenance insights and sell the data and analytic insights back to the manufacturers who might want to know how their products perform within certain usage scenarios and versus key competitors.

In this scenario, there are more application and service opportunities than any single vendor can reasonably supply. That opens the door to transform to a platform-centric business model that creates a platform or ecosystem that enables third party developers to deliver products and services on that platform. And, of course, this puts the platform provider in a position to take a small piece of the "action" in the process, such as subscription fees, rental fees, transaction fees, and referral fees.

Much like the lessons of Nintendo with their third-party video games, and Apple and Google with their respective apps stores, creating such a platform not only benefits your customers who are getting access to a wider variety of high-value apps and services in a more timely manner, it also benefits the platform provider by creating a high level of customer dependency on your platform (for example, by increasing the switching costs).

Companies that try to do all of this on their own will eventually falter because they'll struggle to keep up with the speed and innovation of smaller, hungrier organizations that can spot and act on a market opportunity more quickly. Instead of trying to compete with the smaller, hungrier companies, enable such companies by giving them a platform on which they can quickly and profitability build, market, and support their apps and solutions.

So how does your company make the business metamorphosis from a product to a platform or ecosystem company? Three steps are typically involved:

1. Invest the time researching and shadowing your customers to understand their desired solutions. Focus on what the customer is trying to accomplish, not what they are doing. Think more broadly about their holistic needs, such as:
    - Feeding the family, not just cooking, buying groceries, and going to restaurants
    - Personal transportation, not just buying or leasing cars, scheduling maintenance, and filling the car with gas
    - Personal entertainment, not just going to the theater, buying DVDs, or downloading movies
2. Understand the potential ecosystem players (e.g., developers) and how they could make money off of your platform. Meet with potential ecosystem players to brainstorm and prioritize their different data monetization opportunities to:
    - Clarify, validate, and flush out the ecosystem players' business case
    - Identify the platform requirements that allow the ecosystem players to easily instrument, capture, analyze, and act on insights about their customers' usage patterns and product performance

3. As the platform provider, focus product development, marketing, and partnering efforts on ensuring that the platform:

   - Is easy to develop on and seamlessly supports app developer marketing, sales, service, and support (for example, app fixes, new product releases, addition of new services)
   - Is scalable and reliable with respect to availability, reliability, extensibility, data storage, and analytic processing power
   - Has all the tools, data processing, analytic capabilities (such as recommendation engines), and mobile capabilities to support modern application development
   - Simplifies how qualified third parties make money with respect to contracts, terms and conditions, and payments and collections
   - Enables developers to easily capture and analyze customer usage and product performance data in order to improve their customers' user experience and help the developers optimize their business operations (for example, pricing, promotion, and inventory management)

   This step includes creating user experience mockups and prototypes so that you can understand *exactly* how successfully and seamlessly customers are able to interact with the platform (for example, which interface processes cause users the most problems, or where do users spend an unusual amount of time). Mockups are ideal for web- or smartphone-based applications, but don't be afraid to experiment with different interfaces that have different sets of test customers to improve the user experience. Companies like Facebook have used live experimentation to iterate quickly in improving their user experience. Heavily instrument or tag every engagement point of the user experience so that you can see the usage patterns and potential bottlenecks and points of frustration that the users might have in interacting with the interface.

As your organization advances up the big data business model maturity index, you will see three key cultural or organizational changes:

- Data is becoming a corporate asset to exploit, not a cost of business to be minimized. Your organization starts to realize that data has value, and the more data you have at the most granular levels of detail, the more insights you will be able to tease out of the data.
- Analytics and the supporting analytic algorithms and analytic models are becoming organizational intellectual property that need to be managed, nurtured, and sometimes even protected legally. The models that profile, segment, and acquire your customers, the models that you measure campaign or healthcare treatment effectiveness, the models that you use to predict equipment

maintenance—all of these are potential differentiators in the marketplace that can be exploited for differentiated business value and may need to be legally protected.

- Your organization becomes more comfortable making decisions based on the data and analytics. The business users and business management become more confident in the data and begin trusting what the data is telling them about their business. The need to rely solely on the organization's HiPPO (Highest Paid Person's Opinion) gives way to an organizational culture that values making decisions based on what the data and the analytics are showing.

Big Data Business Model Maturity Observations

The first observation is that the first three phases of the Big Data Business Model Maturity Index are internally focused—optimizing an organization's internal business processes, as highlighted in Figure 1-2. This part of the maturity index leverages an organization's data warehouse and business intelligence investments, especially the key performance indicators, data transformation algorithms, data models, and reports and dashboards around the organization's key business processes. There are four big data capabilities that organizations can leverage to enhance their existing internal business processes as part of the maturity process:

- Mine all the transactional data at the lowest levels of detail much of which is not being analyzed today due to data warehousing costs. We call this the organizational "dark" data.
- Integrate unstructured data with detailed structured (transactional) data to provide new metrics and new dimensions against which to monitor and optimize key business processes.
- Leverage real-time (or low-latency) data feeds to accelerate the organization's ability to identify and act upon business and market opportunities in a timely manner.
- Integrate predictive analytics into your key business processes to uncover insights buried in the massive volumes of detailed structured and unstructured data. (Note: having business users slice and dice the data to uncover insights worked fine when dealing with gigabytes of data, but doesn't work when dealing with terabytes and petabytes of data.)

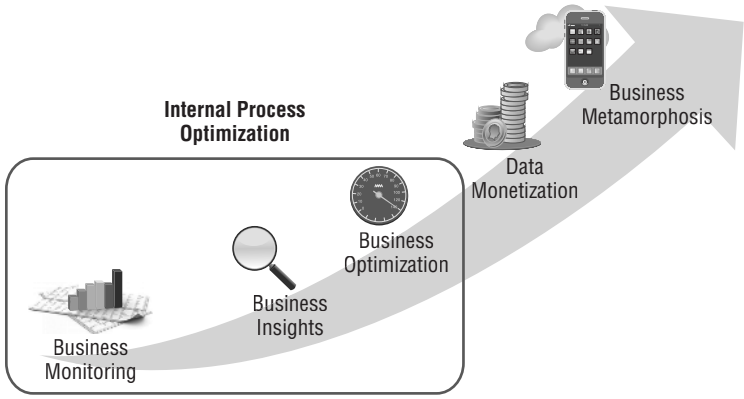

Figure 1-2: Big Data Business Model Maturity Index: Internal Process Optimization

The second observation is that the last two phases of the Big Data Business Model Maturity Index are externally focused—creating new monetization opportunities based upon the customer, product, and market insights gleaned from the first three phases of the maturity index, as highlighted in Figure 1-3. This is the part of the big data journey that catches most organizations' attention; the opportunity to leverage the insights gathered through the optimization of their internal business processes to create new monetization opportunities. We call this area of the Big Data Business Model Maturity Index the four Ms of big data: *Make Me More Money*!

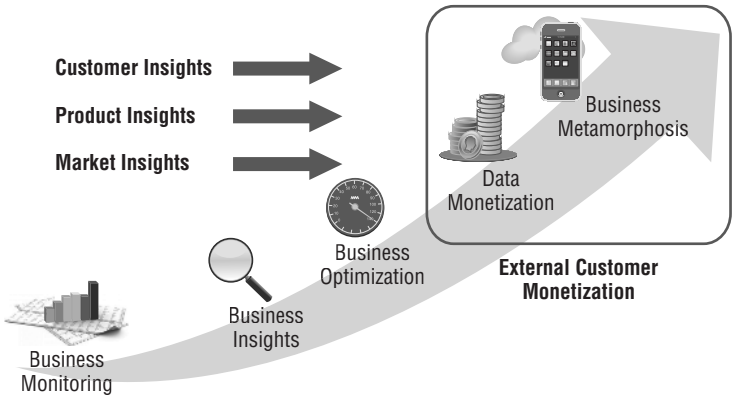

Figure 1-3: Big Data Business Model Maturity Index: External Customer Monetization

Summary

This chapter introduced you to the business drivers behind the big data movement. I talked about the bevy of new data sources available covering structured, semi-structured (for example, log files generated by sensors), and unstructured (e.g., text documents, social media postings, physician comments, service logs, consumer comments) data. I also discussed the growing sources of publicly available data that reside outside the four walls of an organization.

This chapter also briefly covered why traditional data warehousing and business intelligence technologies are struggling with the data volumes, the wide variety of new unstructured data sources and the high-velocity data that shrinks the latency between when a data event occurs and when that data is available for analysis and actions.

Probably most importantly, you learned how leading organizations are leveraging big data to transform their businesses—moving from a retrospective view of the business with partial chunks of data in batch to monitor their business performance, to an environment that integrates predictive analytics with real-time data feeds that leverage all available data in order to optimize the business.

Finally, you were introduced to the concept of the Big Data Business Model Maturity Index as a vehicle for helping your organization identify where they are today, and map out where they could be with respect to leveraging big data to uncover new monetization and business metamorphosis opportunities. Several "How To" guides were included in this chapter to help your organization move from one phase to the next in the maturity index.