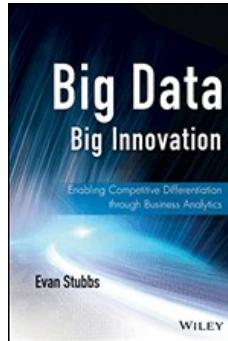# Chapters to Go

Big Data, Big Innovation: Enabling Competitive Differentiation through Business Analytics

by Evan Stubbs

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Chapter 8: Innovating with Dynamic Value

Overview

Success is impossible without knowing what it is you're trying to achieve. Ironically, one of the biggest challenges in getting value from big data is usually working out where to start. Given a smorgasbord, the worst thing to do is to try to eat everything at once.

As a rule, we're a species that enjoys self-improvement. Faced with a problem and motivation, most of us would rather solve it than live with it. We may not all have the ability to tear down a car for servicing, but given the right set of skills, the right opportunity, and the right motivation, anyone can innovate.

Consider James, our well-intentioned if slightly erratic innovator. In his journey to monetize his organization's data assets, he recognized fairly early that analysis alone wasn't enough. He sold his vision on the back of innovation and, one way or another, he had to deliver it. Unfortunately, he failed to understand what he meant by "innovation." Because of that, many of his successes in his first year were underappreciated or outright overlooked.

Innovation sounds sexy. It's also pretty amorphous; if it were easy, there probably wouldn't be so many books on the topic. The best starting point is to remember that there's a difference between *innovation* and *invention.* Invention is unique; it represents the original creation of something new. By contrast, not all innovations need be completely novel. In fact, the opposite is normally true—most innovations are simply improvements to existing knowledge, processes, or products.

Invention can only happen once for a given concept. Innovation based on that invention, however, can happen millions of times; innovators improve inventions and often repurpose them. Dr. Martin Cooper may have been the father of the mobile telephone. However, it was HTCT, TMN, and Eircell (among others) that took that invention and changed the way payments were made to reinvent the composition of their industry through prepaid mobile plans. Great success comes from either; just because it's not groundbreaking doesn't mean it isn't innovative. The trick is in viewing innovation not as a one-off activity but as a repeatable process.
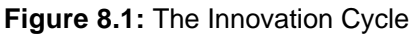
This chapter brings everything together. It links big data, analytics, and human capital into an *innovation engine*, one that creates *dynamic value*. It covers:

- The innovation cycle

- The innovation paradox

- The secret to success: dynamic value

- The innovation engine

- Reinventing the rōnin

The Innovation Cycle

Innovation, at least conceptually, is actually surprisingly straightforward. There needs to be a good idea. There needs to be a way of translating that idea into a solution to a specific problem. There needs to be a way of making that idea a reality. These are simple steps, but they're deceptively hard to do. Many ideas get lost because there isn't a clear channel to take advantage of them. The vast majority of innovations go nowhere—it's easier to think than it is to do.

This innovation cycle is shown in . Big outcomes always start with ideation, the process of generating ideas. These ideas are then made real through invention or innovation, usually accompanied by a great deal of experimentation and effort. And finally, the successful prototypes are commercialized.

Figure 8.1: The Innovation Cycle

Business analytics isn't any different. Generating innovation from big data is straightforward, if not necessarily easy. It starts with an operating model that:

- Encourages and rewards a culture of creativity, curiosity, and ownership

- Translates the innovation cycle into a practical process

- Prioritizes effort and investment based on value creation, not activity

Get those right and while not guaranteed, innovation and invention at least becomes achievable.

As with many things, innovation is rooted in culture. Anyone can innovate as long as they're given the freedom, flexibility, and tools to do so. Big data represents a treasure-trove of fertile ground for potentially innovative novel datamashups, insights, and solutions. Unsolved problems often lead to invention. And, coming up with interesting ideas or problem definitions can often be as easy as encouraging cross-pollination of experience and knowledge through internal rotation or external networking. What's standard in one industry may be ground-breaking in another.

To come up with good ideas, people need to feel comfortable doing so. Ideation is impossible when people are punished for being creative and having curiosity. Equally, motivation is impossible without some degree of ownership and some form of reward, financial or otherwise. Organizations that refuse to acknowledge internal challenges are a classic example of this.

The manufacturer discussed in Chapter 3 refused to recognize that many of their core problems came not from external issues but from internal inefficiencies. A significant proportion of their business model revolved around importing foreign products and distributing them domestically. Unfortunately, their volumes were highly volatile; if they ordered a thousand of a particular item in any given month, in three months they might have received anywhere from five hundred to two thousand.

Among many other challenges, the organization had developed a self-reinforcing culture of accepting the status quo and discouraging curiosity. Every attempt by new hires to investigate and resolve the source of this uncertainty was discouraged in favor of the existing process. In most cases, these new hires eventually left for more supportive cultures, further reinforcing the dominant culture. The true irony is that that same organization not only had the data to solve their issues but was already using relevant simulation and forecasting techniques elsewhere in the business to solve the same problem in an unrelated area.

Eventually, this culture was a contributing factor to killing the organization. Constant profit erosion and customer dissatisfaction led to declining market share. After repeated cycles of downsizing and redundancies, they passed the point of no return.

The Innovation Paradox

Encouraging ideas represents the starting point. If relevant and feasible, some of these ideas may generate true invention. PageRank, an algorithm developed by Larry Page and Sergey Brin while at Stanford, used large amounts of data to rank information importance based on link popularity. That single invention ended up spawning one of the world's largest companies, Google. More importantly though, not every innovation is the same. The best way to improve the ratio of effort to success is to understand that for the vast majority of organizations, certain types of innovation are inherently incompatible.

Some of us are dreamers, entranced by the world that might be. Others of us are doers, interested in improving our existing world. Some straddle the two, equally at home in both worlds. We're inherently flexible; we adapt to our social structure, our surroundings, and even our desires.

Organizations don't work this way. People need to be aligned. There needs to be direction. They require structure to succeed; by definition, without structure there is no organization. There's simply a collection of individuals.

This structure carries significant advantages. It distributes authority and streamlines decision-making processes. It makes it easy to mobilize a large number of people around a common goal. And, when operating effectively, it offers efficiencies that would be otherwise impossible to achieve individually regardless of knowledge, skill, or experience.

Unfortunately, these advantages do not come free. Larger organizations face increased transaction costs; coordinating thousands of people is far harder than coordinating 50. Bureaucracy and diseconomies of scale have ground more than one organization to a halt. Equally, directed authority is a benefit *and* a curse. It helps drive efficiency and experience. Being able to focus in a specific area helps build capability. It also constrains focus to the scope of authority. In most situations, this unknowingly eliminates one of two types of innovation.

To understand how this works in practice, consider the different operating models of two groups in an organization. On one side is a team responsible for various business-as-usual activities, many of which could be improved in countless ways through reusing the organization's data and existing analytics capabilities. On the other is the executive team, driven by the shareholders to ensure growth and commercial success. Both are aligned around organizational success. The form that success takes, however, might be slightly different.

To the team, success might be defined by efficiency. Efficiency will improve profitability, thereby delivering shareholder value. One source of innovation in their mind might be the use of Six Sigma techniques or analytical process automation. To the executive team, however, success might be defined through reinvention. If their market is mature, opportunities for growth might be limited. Innovation in their mind might stem from leveraging existing data assets to move into new market segments, diversifying their business and opening new growth avenues.

Both are legitimately innovation, and both are valuable. There is a difference, though: one is *evolutionary* innovation and the other *revolutionary* innovation (or, in author Clayton M. Christensen's terminology, *sustaining* and *disruptive* innovation [1]). To the team, innovation might come from chasing continuous improvement. Toyota, through their application of *kaizen*, became tremendously successful taking this approach. Constant and continual improvement over a sustained enough period of time can create deep pricing and quality differentiation.

To the executive team however, innovation might come from doing things fundamentally differently. They might be more interested in questioning their existing business models and potentially actively disrupting their own markets. Reinvention is a powerful force and organizations like Apple are famous for actively cannibalizing their own markets before others can. This, too, can create deep differentiation, through developing inimitable goods, capabilities, or processes.[2]

Both are tremendously valuable. Critically though, it's almost impossible to charge any single person with doing both. Even though he may have the capability and interest in doing either, asking him to do both amounts to asking someone to both improve what he's doing as well as stop doing what he's doing. This forces cognitive dissonance, the outcome of which can only be either ignoring one approach or becoming paralyzed with indecision.

The business *requires* repeatability and efficiency. However, revolutionary innovation *requires* questioning the status quo and "breaking the rules." Even worse, the second is an active threat to the first. Large organizations are built to sustain and perpetuate their business models. Successful revolutionary innovations *force* change and disruption. Without forethought or a plan, being put in charge of "disruptive innovation" is often a poisonous pill. When left unmanaged, the conflict between evolution and revolution almost always ends with casualties; the organization fractures until the individuals charged with revolutionary innovation are driven from the company. All things being equal, in a battle between the two,

business as usual *always* wins.

A prime example of this conflict involved a publisher facing market disruption. Like many traditional publishers, they were under threat from the twin forces of "free" content and the move to digital media. Their revenue model was heavily biased toward advertising—even though they operated on a paid subscription basis, the subscription fees they received barely covered the cost of paper and distribution. Once the fixed costs of journalists and plant were taken into account, their subscriptions alone would have left them bankrupt in mere months.

Their profitability depended on advertising. And, the rates they could charge from advertising were based on their subscriber numbers. In effect, they didn't sell content; they sold eyeballs. Their customers were not their readers; they were the companies interested in paying for advertising space. As business models go, theirs was a fairly standard one in the industry. It did, however, create an interesting dynamic when it came to inventory management.

For retailers, the ideal stock management model is to have no products left on shelves at the end of the replenishment period. They keep stock levels at a minimum, freeing up capital and improving liquidity. By shifting the focus of the business to replenishment rather than space management, they improve sales velocity and revenue generation.

For publishers, having no products left on the shelf at the end of the replenishment period is actually a significant problem. Because their revenues were directly tied to the number of people they could get their product in front of, having empty shelves meant that they might have been able to sell *more* product had they not had a stockout. Given they were already carrying the significant fixed cost of a large distribution network with a daily replenishment schedule, the incremental cost of an additional newspaper was negligible compared to the advertising losses caused by a smaller readership.

Managing this need to maximize readers had created all sorts of complexity. In their need to drive continual efficiency and support innovation, their distribution teams had developed countless complex rules to take into account the difference between weekday and weekend editions, the effect of rain in different suburbs, and even the effect of different covers on purchasing rates.

The rules were astonishingly specific. For example, they'd found that covers with busty women tended to sell better in specific suburbs on specific days of the week unless it was during school holidays! To take advantage of these variations on sales volumes, they'd built a tremendously complex set of rules that would determine the correct number of papers for distribution to a specific news outlet the night before deliveries were to take place.

When I dealt with them, the business had fractured into two different sets of opinions. The bulk of the business believed in their current model. While it was becoming increasingly unmanageable, they believed that a more scalable technology platform designed for managing rules would help them extend their exception-based management approach down from a suburb level to a news-agent level.

There was also a small set of individuals who believed that they were going about this the wrong way. Rather than rely on what was an ever-growing team of distribution managers, they felt that they might be able to leverage their data assets to *automatically* generate accurate forecasts. They'd built prototypes that had shown that relatively unsophisticated stochastic forecasting and simulation methods could generate forecasts as accurate as their existing rule set. Importantly, though, those same forecasts had only required a team of five to develop and manage in comparison to the existing 80-strong distribution team.

Both groups were innovative. The distribution team were experts in evolutionary innovation from data analysis. The "new guard" were able to demonstrate the power of revolutionary innovation through automated analytics. Unfortunately, the organization ended up compromising on only evolutionary innovation. Because they couldn't manage the internal conflict between the two groups, their core business won the battle and they missed a spectacular opportunity.

[1]Clayton M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business School, 1997).

[2]For more detail on how business analytics augments business models and leads to competitive differentiation, see Evan Stubbs, *Delivering Business Analytics: Practical Guidelines for Best Practice* (Hoboken, NJ: John Wiley & Sons, 2013), Chapter 2, and Evan Stubbs, *The Value of Business Analytics: Identifying the Path to Profitability* (Hoboken, NJ: John Wiley & Sons, 2011).

The Secret to Success: Dynamic Value

The trick to enabling innovation from big data is not to fight against these inherent conflicts but instead to embrace them.

Authors Vijay Govindarajan and Chris Trimble talk of the "performance engine," the core of the business that seeks operational excellence and ongoing profitability.[3] This engine, while an excellent optimizer, is generally poor at revolutionary innovation. It's the reason that most organizations are actively allergic to things that challenge their existing business model. Anything that threatens the status quo triggers an immune response that rapidly acts against disruption. This isn't because people don't have the skill, the knowledge, or even the interest. It's because the organization's operating model emphasizes discipline and repeatability over disruption.

Big data is an enabler for both evolutionary *and* revolutionary innovation. To realize both, organizations need to establish separate teams with different operating models. Analytical capabilities must be embedded within business-as-usual operations. Without access to these skills, organizations miss opportunities to realize incremental improvements through business analytics. Visualization, exploration, and process modeling through techniques such as Six Sigma can help identify and deliver countless improvements.

To ensure long-term success, organizations also need to be willing to challenge and potentially reinvent their existing business models. Big data, when harnessed, can transform organizations. In some cases, this might involve expanding into parallel industries, such as in the case of retailers using their knowledge of customer purchasing patterns to expand into coalition loyalty programs or banking and financial services. In other cases, it might make entire areas of the business redundant due to analytical automation, such as in the case of the publisher discussed earlier.

The challenge, naturally, is to develop a holistic operating model that maintains a healthy dynamic tension between operational excellence in the context of organizational stability and disruptive innovation in the context of reinvention. This is easier than it would appear once the building blocks are understood. Overlaying these different types of innovation on the wheel of value gives the operating model and organization design shown in Figure 8.2.
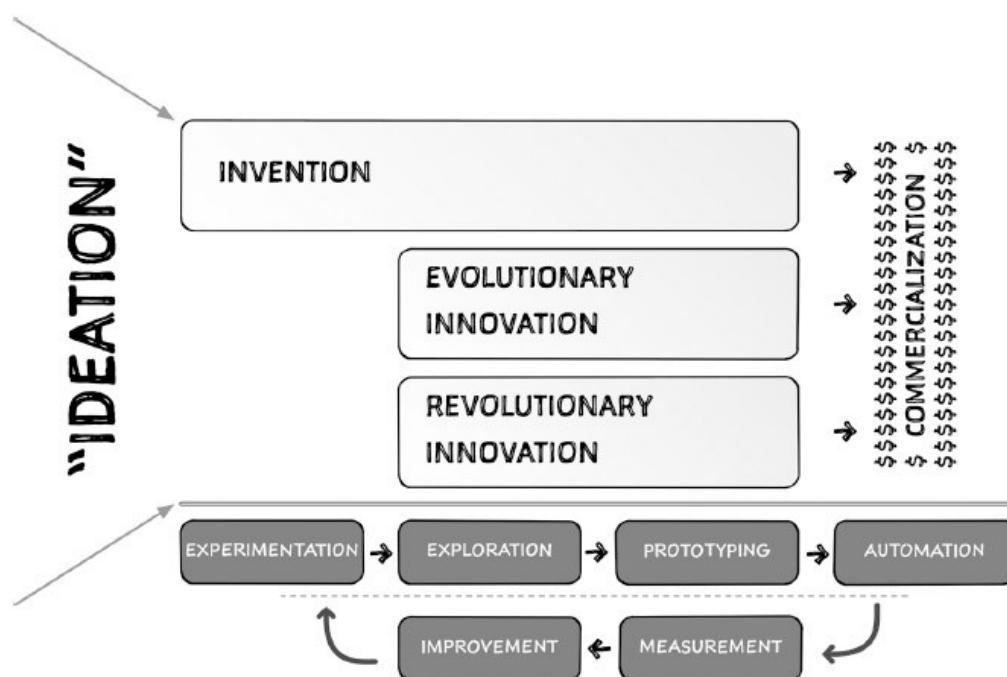

Figure 8.2: Dynamic Value

Ideation is primarily a cultural challenge. People need to feel safe in sharing their ideas. The leadership team has a critical role in creating this culture, whether it's through reward structures, recognition, or even simply a "good ideas" register. Good ideas on their own are worth little, however; they need a home. Rather than try to task everyone with doing everything, it's better to charge different groups with different objectives.

Invention is often best left to dedicated research and development teams. There are good reasons for this. For example, invention usually has very different goals from the performance engine. Not all inventions will turn profitable. Instead, a common measure of success is the *volume* of novel and relevant outputs generated by the group. Because of this, putting too much emphasis on profitability through the pure research and development stage can act as an inhibitor for invention. The team becomes so focused on demonstrating return that creativity and ingenuity suffer.

Evolutionary innovation is often best left to the performance engine. Usually, they have direct responsibility for ongoing

commercial success. They often measure success through very tangible financial measures such as profitability, cost, or revenue. And because of this, they understand their business better than anyone else in the organization. This places them in the best position to deliver continuous improvements. Not only do they usually have the best perspective on where the opportunities lie but they also have the best understanding of the real-world challenges that might prevent good ideas from being executed.

Finally, revolutionary innovation is often best left to a separate, dedicated team. Their names vary; often named SWAT or Tiger teams, their focus is on developing creative solutions to challenging problems. Usually multidisciplinary, they are granted significant freedom and encouraged to challenge and question assumptions. By nature, they are usually in direct conflict with the performance engine. Because of this, their sustainability is heavily dependent on the support they receive from their leadership team. They often also act as the bridge between the research and development team and the business as a whole, looking for opportunities to apply novel inventions in a commercial context.

Managing the dynamic tension between these groups is both the challenge and the solution. Tension lies at the heart of innovation. Too little and the organization becomes complacent and lazy, comfortable in the belief that it's doing the right thing. Every empire has eventually ended, from the Babylonians to the Romans to the British. Whether it's measured in months or years, complacency is inevitably the start of the end in a competitive market.

However, too much tension and the organization becomes paralyzed by political gridlock. Each of these groups usually offers a wildly different perspective on what's important to the business. And, each is usually right in their own way. Groupthink is a dangerous force and too much time spent in a self-reinforcing culture can lead to irrational or inefficient decision making.[4] In the worst cases, the chasm between these groups becomes so significant that it fractures the organization.

The trick to managing this tension is to create counterbalancing forces that sustain and temper. Creating tension is as easy as establishing different groups with directly conflicting objectives. While there should be no overlap in the *outcomes* owned by each group, there are significant benefits to having these outcomes being somewhat contradictory.

For example, every bank maintains one group responsible for risk management and one or more groups responsible for customer acquisition. Objectively, these groups are in direct conflict. To minimize risk, all a bank needs to do is to set acceptable risk thresholds as low as possible. This would minimize defaults and significantly improve profitability across all products. However, doing so would usually severely impact market growth and share value—in avoiding *all* risk, the bank would forgo customers who, while risky, might never default. This would also put their customer growth rates lower than the market average.

In this model, each group is responsible for a different outcome. The risk group is responsible for measuring and managing portfolio risk while the customer acquisition team is responsible for ensuring competitive or market-leading customer growth volumes. While distinct, these outcomes are interrelated. And by maintaining this conflict, the bank's leadership team can ensure they have access to equally valid (if different) points of view when making decisions.

These different points of view help create tension. They also help sow discord; more than one organization has collapsed into a collection of holding companies or personal fiefdoms because of it. While some tension encourages creativity and debate, too much creates a dysfunctional culture. The trick to tempering this tension is to create de facto diplomats, knowledgeable about the organization's broader context and capable of balancing the otherwise-polar positions these groups will sometimes take. While not usually an explicit part of their job description, their diplomacy comes through a combination of colocation and professional mobility.

Rather than being tied solely to one of the three groups, they move between them on a relatively regular basis, gaining exposure to all aspects of the business. Not only does this help temper political differences but it helps develop their understanding of the business, building their domain competencies and encouraging career progression and retention through exposure to new opportunities. To build trust and understanding, they work alongside their peers while in a particular group. Instead of being a disembodied voice on the other end of a phone, they become part of the team.

Because their skills are portable between business problems, data scientists and value architects fit this model perfectly. While they may still report into a different area, they become embedded in one of the three groups and help support invention, evolutionary improvements, or revolutionary innovation.

Finally, the prototype solutions that each of these groups develop need to be commercialized in some way. This may involve the operational use of their analytical assets such as the use of algorithms to guide product recommendations, such as Amazon's "Related to Items You've Viewed" or Netflix's Recommendations. It may involve the commercialization and/or productization of an algorithm such as the use of Quality Score by Google to inform AdWords. Commercialization

goes beyond algorithms and mathematics. Among other things, it needs to meet regulatory and legal requirements. It needs to be robust and scalable enough to ensure business continuity. And, it needs to meet market requirements; a great idea is worthless if no-one is interested in it or if it's too expensive.

[3]Vijay Govindarajan and Chris Trimble, *The Other Side of Innovation: Solving the Execution Challenge* (Boston: Harvard Business School, 2010).

[4]James K. Esser, "Alive and Well after 25 Years: A Review of Groupthink Research," *Organizational Behavior and Human Decision Processes* 73, nos. 2–3 (1998): 116–141.

The Innovation Engine

Eating the metaphorical elephant is easy. You just do it one mouthful at a time. It's the same in facilitating innovation; get the culture, structure, and focus right and magic happens.

Building the right structure starts with defining what it is you're trying to achieve and what the focus should be. Data can enable invention, making real a good idea. It can enable evolutionary innovation, delivering value through incremental improvements. It can also support revolutionary innovation, reinventing business models, and changing markets.

To succeed, groups need parameters to work within. Working off a totally blank page is exceedingly challenging; without knowing what success looks like, it's impossible to know when one's succeeded. The hunt for value from big data and business analytics can take place at two levels. Groups can search for local improvements in a targeted domain, using a business focus as the primary driver for direction. This equates to "going deep," diving into a particular area and exhaustively pursuing total process control and analytical perfection in a specific area. Examples include excellence in logistics, customer engagement, or pricing.

They can also search globally, looking to leverage a functional capability across many domains. This equates to "going broad," taking an existing analytical competency and exhaustively applying it across as many relevant business problems as they can find. An example might be reusing predictive modeling and operational analytics capabilities across customer retention, fraud prevention, and next-best-offer recommendations. Together, these give the *innovation engine*, as shown in Figure 8.3.
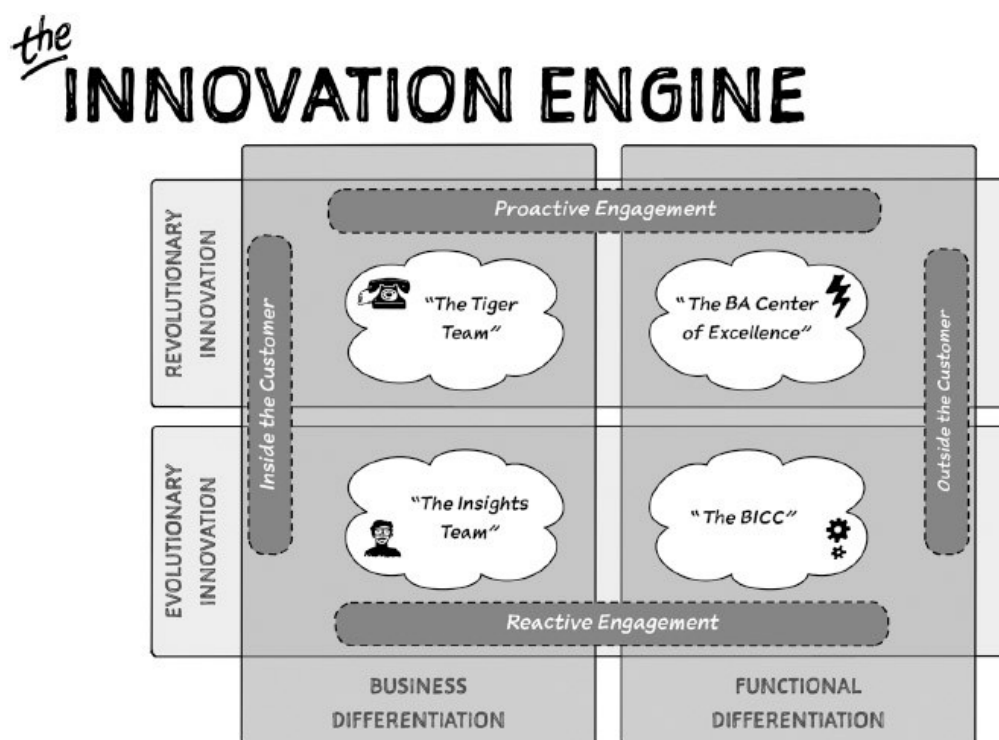

Figure 8.3: The Innovation Engine

On the bottom half of the figure are groups focused on supporting stakeholders in solving known problems across the business. These often include "insights" groups, embedded analysts, and competency centers. Their main motivation is to

deliver efficiency and continuous improvement through evolutionary innovations, honing their skills, and improving the performance engine. They tend to operate on a reactive basis, working in partnership with the business through a service-delivery model. They operate on an open-door policy, tightly integrated with business-as-usual operations.

In the top half are groups focused on finding the "unknown unknowns." These often include SWAT and Tiger teams as well as Centers of Excellence. Their main motivation is to identify and deliver change through revolutionary innovations, challenging the performance engine and chasing reinvention. They tend to operate on a proactive basis, actively hunting for opportunities to leverage big data and apply business analytics. Rather than waiting to be engaged, they talk in terms of value creation and look to drive organizational transformation.

On the left side of the figure are groups that usually exist inside their customers, being part of the group that covers their costs. Their focus is defined by their reporting line and their activities are often limited to a specific domain. Vertically focused, they align against a specific business function. Common examples include marketing analytics, logistical optimization, or pricing improvement.

On the right side are groups that usually exist outside their customers, usually operating as an organizational group function. Their focus is defined by their functional capabilities and their activities are directed toward problems that can be solved by their area of expertise. Horizontally aligned, they provide common functions to the broader organization. Common examples include business intelligence competency centers and analytical centers of excellence.

Their broader engagement means that they normally report to a group function. Groups in the bottom-right quadrant typically have a close alignment to IT service delivery and as such often report to the chief information officer or chief knowledge officer. Typically cost centers, they often operate as either a fixed-cost group or a combination fixed-cost or transfer-price group funded by project investment. Methodologies such as ITIL and other service-based, highly repeatable techniques work well—as their goal is usually repeatability and efficiency, they excel in delivering incremental value through operational efficiency.

Groups in the top right of the figure tend to emphasize flexibility and change. Their main requirement is to be located outside of their customers. When a group charged with enterprise transformation is located inside one of their customers, they regress to functional solutions and move from the right-hand side to the left-hand side of the framework. Equally, while there are examples where highly effective teams report to the chief information officer, their need for flexibility and fixed-cost-based exploration during the early stages of the innovation operating model tends to run counter to highly efficient IT organizations. Because of this, common locations include reporting to the chief operating officer, the chief analytics officer, or the chief data scientist. There's nothing that precludes their existing under a group function such as the chief financial officer *as long as* they have a clear mandate to work across the group, not just in their own patch.

Success for these groups is usually measured by their ability to deliver value creation through change. Often operating as profit centers, whether through a direct profit and loss (P&L) or a shadow P&L, their goal is direct revenue generation, often to the point where the group is self-funded.

Groups in the bottom half of Figure 8.3 rarely require dedicated data scientists or value architects. Instead, their value comes from scale, repeatability, and service delivery. Groups in the top half, however, require data scientists and value architects if they are to succeed. Their value comes from reinvention and change. Without a clear linkage to value, the organization will typically reject the change they recommend.

A critical point about this framework is that a sufficiently large organization may have groups operating in all these quadrants. Rather than being a negative, this is actually a positive. Giving analysts the opportunity to see and solve both functional and enterprise business opportunities helps improve their "knowhow" and "understanding" dimensions within the human capital model described in Chapter 7. Giving them exposure to the variety of pressures each business unit faces helps improve their ability to act as a data diplomat, building their value architect skills and tempering tension without having to sacrifice the creativity it provides.

The aligning force behind what would otherwise be a highly complex and potentially conflicting model is the commercialization team sitting behind the scenes. As each group is responsible only for up to the prototyping stage, the commercialization group acts as a gate to ensure that big data and business analytics solutions are not needlessly duplicated. A defined and clear operating model helps ensure every group understands their role within the overall process and, given appropriate leadership, minimizes effort duplication.

Overall, this may seem complex. Unfortunately, so is the field. At its simplest, the answer is this: separate improvement from disruption and get the right teams focused on the right areas. Delivering a package from anywhere to anywhere else in the world overnight would once have seemed impossible. And yet, today we do it daily without a second thought. Get the

model right and everything follows.

Reinventing the Rōnin

An organization designed to facilitate innovation will have little success without the right people and culture. While the rōnin may have the skills needed to help generate value from big data, they won't always have the right mindset. The final piece of the picture is in getting people to *enable* the organization rather than *support* it; democratize analytics and anything's possible.

Getting the right person is only the start—once hired, they have the responsibility to use their skills to improve outcomes. Over time these responsibilities have changed, and not always in ways that fall within people's comfort zones. Consistent with the trends already discussed, the biggest of these changes has been a movement away from insight generation to driving change. This is more than just lip service—it requires very different responsibilities. Being aware of these differences and actively fostering them is one of the major differences between organizations that are successful in business analytics compared to those that are simply mediocre.

Much like how Henry Ford redefined manufacturing, the traditional approach is very focused on activities and delivery. Those who have highly technical and specialized skills play the role of an expert, driving insight and answering questions. Because their skills are scarce, they form the core of a larger team focused on generating insight. Their role within this team is to apply advanced analytics to create some form of insight. Once they have this insight, the rest of the team carries the responsibility to translate it into something that's easily digestible. This goes by many names but is often called a *presentation layer* and is delivered by the business intelligence (BI) team.

This information is then consumed by decision makers, usually with no linkage between the information and the resulting outcomes. Because decision making happens independently from reviewing insights, it's impossible to quantify how much of a difference the insight made in driving a better outcome. Planners may or may not review the reports produced by the BI team; even if they do read them, there's no guarantee that they acted on the insights.

Despite these limitations, this sequential approach makes intuitive sense. A core set of individuals extracts value, a larger set of individuals converts this intermediate good into a finished good, and the rest of the organization consumes that finished good. Henry Ford would be proud—the engineers do the work, the factory creates the product, and the public consumes the product. However, business analytics isn't manufacturing. As logical as it may be, it inevitably creates a number of insurmountable bottlenecks that demand a different approach.

The first and biggest bottleneck is that there are only so many people one can hire for this core group. Business analytics drives competitive differentiation and one of its biggest sources of value is its ability to solve multiple business problems at relatively low incremental cost. Most of the cost lies in acquiring the right skills, technology, process, and information— once these are in place, the organization capitalizes on economies of scope. Unfortunately, this still requires some degree of incremental resource. Because these skills are so scarce, it's extremely difficult to scale to solve other problems within the organization. Simply put, there aren't enough hours in the day to use this core team to solve other problems.

Paradoxically, this constraint isn't for technical reasons. One would intuitively think that because of the high degree of specialization required to understand many fields of advanced analytics, many of the barriers would be due to the tools used. This isn't the case— while sophisticated analytics requires deeply technical knowledge to apply safely and robustly, the tools themselves are becoming increasingly simple to use. Where building a predictive model used to require programming skills, modern tools allow someone with 20 minutes worth of training to develop a model. It may not necessarily be a good or robust model, but it will be a model and it will produce a prediction that in many cases is better than a guess.

Technologically, there is no good reason why everyone in the organization couldn't create their own insights. This concept is often referred to as the "democratization of analytics"—it revolves around giving everyone the freedom to develop their own insights. Conceptually, this seems to eliminate the problem—if everyone can apply sophisticated analytics, specialized skills are irrelevant.

As with all oversimplifications, the reality is drastically different. It's important to remember that just because it's technically possible doesn't mean that it will produce a good outcome—knowledge, training, and experience are critical elements in producing a reliable prediction. Not all insights are equal and much of that specialist knowledge revolves around being able to differentiate reliable insights from those that are just mathematically attractive. As a very crude analogy, there's nothing to stop one claiming anything they want as a business expense on their personal income tax. Unfortunately, the immutable force of reality (the taxation office in this case) will normally provide a rather sobering experience if those questionable insights are acted on. Without a tax accountant's insights, it's dangerously easy to make some serious mistakes.

This specialization combined with a lack of technologically based constraints changes the operating model. Rather than being an analyst, the most advanced practitioners need to instead become mentors and quality control experts, providing overarching governance and guidance to those creating insight. Their role shifts from being the engine of analytics to being an enabler, becoming the fuel that helps drive innovation. The BI team, in turn, shifts from visualizing already-processed information to covering a broader spectrum of business analytics, usually covering both historical and predictive analytics. This is akin to becoming a "creator" of business analytics rather than just a "reporter." To prevent bad assumptions, the core mentoring team provides a level of governance and review over insights before they go into production.

This transformation continues to the "information consumers" who become "active decision makers." The distinction seems small but is enormous in practice—by linking the insights they've used to the outcomes and actions they've taken, they quantify the real value of business analytics. This is more than just a conceptual linkage and usually occurs at a very operational level with measurable differences. Reports gradually give way to workflows and approval processes.

Managing these newly defined skills takes focus; standard key performance indicators and management models rarely drive the most value. Organizations following a manufacturing approach tend to benchmark performance based on processing volumes, efficiency, and knowledge. There's good reason for this—they view analytics as a series of discrete activities. Their focus is usually on trying to integrate different business units, each of which often acts seemingly independently. Modelers are assessed on their ability to develop and deploy models. BI specialists are benchmarked on their ability to generate reports and insights are usually (but not always) designed to meet functional requirements defined by the business. Roles are normally defined based on technical knowledge.

One of the reasons this approach is so prevalent is because teams are usually arbitrarily defined based on technical skills. Rather than focusing on outcomes, an artificial distinction is made between the business intelligence or reporting team (often embedded within IT or finance), the analytics team (usually embedded within a functional line of business), and "the business." Because these groups are functionally and structurally separated, it makes sense to define roles in these terms. One of the biggest problems with this approach is that it makes it very difficult to task individuals based on outcomes—because technical activities and business outcomes are functionally separated, it's hard for the organization to link a group or individual's actions to specific outcomes.

Organizations focused on enablement usually benchmark performance on outcomes. Analytics is seen as being part of a value chain and not an activity in its own right. Management focus is usually on achieving economies of scope by solving multiple business problems across different functional areas. Mentors and creators are benchmarked not only on their ability to drive positive outcomes but also their ability to proactively drive value creation by engaging with decision makers. Roles are defined based on experience and competency (rather than the ability to use a particular piece of technology).

The benefits of this approach are enormous. First, the organization takes active steps toward achieving economies of scope by breaking down the barriers normally associated with functionally separated business units. Second, the organization overcomes many of the challenges inherent in hiring from a relatively small resource pool. Finally, it greatly simplifies measuring success—rather than make a subjective assessment of the value added by business analytics, it directly tracks outcomes through well-defined value chains. While it's still possible to realize value from business analytics without moving to an enablement model, adopting this approach helps drive maturity and competitive differentiation.

Notes

1. Clayton M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business School, 1997).

2. For more detail on how business analytics augments business models and leads to competitive differentiation, see Evan Stubbs, *Delivering Business Analytics: Practical Guidelines for Best Practice* (Hoboken, NJ: John Wiley & Sons, 2013), Chapter 2, and Evan Stubbs, *The Value of Business Analytics: Identifying the Path to Profitability* (Hoboken, NJ: John Wiley & Sons, 2011).

3. Vijay Govindarajan and Chris Trimble, *The Other Side of Innovation: Solving the Execution Challenge* (Boston: Harvard Business School, 2010).

4. James K. Esser, "Alive and Well after 25 Years: A Review of Groupthink Research," *Organizational Behavior and Human Decision Processes* 73, nos. 2–3 (1998): 116–141.