CHAPTER 1

Introduction

The explosion of information is accelerating. This can be seen in our everyday use of emails, online searches, text messages, blog posts, and postings on Facebook and YouTube. The amount of data being created and captured is staggering. It is flooding corporate walls and is only getting worse as the next big explosion is already upon us, the Internet of Things, when our machines talk to each other. At this point, the rate of information growth may go exponential. In his article for *Industry Tap*, David Russell Schilling explained the theory behind futurist Buckminster Fuller's "Knowledge Doubling Curve."

> … until 1900 human knowledge doubled approximately every century. By the end of World War II knowledge was doubling every 25 years. Today … human knowledge is doubling every 13 months. According to IBM, the buildout of the "internet of things" will lead to the doubling of knowledge every 12 hours.

According to Gartner, as many as 25 billion things will be connected by 2020. As we try to make sense of this information, of what Tom Davenport calls the "analytics of things," we will need methods and tools to assimilate and distill the information into actionable insights that drive revenue. Having these troves of information is of little value if they are not utilized to give our companies a competitive edge. How are companies approaching the problem of monetizing this information today?

> One approach that gets inconsistent results, for instance, is simple data mining. Corralling huge data sets allows companies to run dozens of statistical tests to identify submerged patterns, but that provides little benefit if managers can't effectively use the correlations to enhance business performance. A pure data-mining approach often leads to an endless search for what the data really say.

This is a quote from the *Harvard Business Review* article, "Making Advanced Analytics Work for You," by Dominic Barton and David Court. This idea is further reinforced by Jason Reiling, Group Director of Trade Capability at The Coca-Cola Company, who commented, "If we don't link the business use of the data with the hypothesis and overall objective, we find situations where the data is guiding the analysis, versus the business guiding the data." This sums up one of the biggest challenges that exist in analytics today: organizations are throwing data at the problem hoping to find a solution versus understanding the business problem and aligning the right data and methods to it.

What begins to matter more at this point is not necessarily the amount of data, but the ability to codify and distill this information into meaningful insights. Companies are struggling with this issue due to lack of integrated methods, tools, techniques, and resources. If they are able to solve this challenge, they will have a clear competitive advantage. However, this only solves part of the problem; even with the most relevant information, companies are mired in poor decision making.

Decisions

The ultimate goal of collecting and synthesizing this information is to provide insights to executives and managers to make better decisions. Decisions are at the heart of your business and the most powerful tool most managers have for achieving results. The quality of the decisions will directly impact the success of your organization. It is no longer acceptable to equip organizational leaders, managers, and analysts with one-off training courses and conferences, expecting them to make quality decisions based on limited knowledge and gut feel. They have more information coming at them than ever before. Distilling the flood of information into actionable decisions that your organization can monetize is the new challenge.

Unfortunately, simply distilling the information is not enough. There are various ways we undermine our ability to make quality decisions, from decision fatigue to cognitive bias. One way to improve decision making is by using best practices and the collective wisdom of the organization. However, this practice is not widely implemented. In a study by Erik Larson of over 500 managers and executives, they found that only 2 percent apply these best practices when making decisions. Furthermore, even fewer companies have solutions in place to improve decision making.

When executives are not applying best practices or data to make a decision, more often than not they are relying on their intuition or "gut." This type of decision making is riddled with flaws and often brings in cognitive biases that influence choice. A cognitive bias is a deviation from the norm in judgment based on one's preferences and beliefs. For example, confirmation bias is the tendency to look for information that confirms our existing opinions and thoughts. These biases distort our judgment and lead to errors in choice.

Another culprit of poor decisions is the hidden influences that can affect our decisions, such as mood. For example, let's take a decision about staffing between two field managers in two different locations. Whom to hire, when to hire someone, when to let someone go are all decisions they make based on little data and not much coaching. The decisions between two managers can vary to a large degree based on years and type of experience, mood on that particular day, and other factors that may be occurring in their life at that moment. These two individuals are likely to make different decisions on staffing even when presented with identical circumstances. This type of discrepancy in decision making is what the authors of "Noise: How to Overcome the High, Hidden Cost of Inconsistent Decision Making" call *noise*.

> The problem is that humans are unreliable decision makers; their judgments are strongly influenced by irrelevant factors, such as their current mood, the time since their last meal, and the weather. We call the chance variability of judgments noise. It is an invisible tax on the bottom line of many companies.
>
> The prevalence of noise has been demonstrated in several studies. Academic researchers have repeatedly confirmed that professionals often contradict their own prior judgments when given the same data on different occasions. For instance, when

> software developers were asked on two separate days to estimate the completion time for a given task, the hours they projected differed by 71%, on average. When pathologists made two assessments of the severity of biopsy results, the correlation between their ratings was only .61 (out of a perfect 1.0), indicating that they made inconsistent diagnoses quite frequently.

Along with noise, another impediment to decision making is *decision fatigue*. Decision fatigue is the deteriorating quality of your ability to make good decisions throughout the course of a day of making decisions. For example, scientists Shai Danziger, Jonathan Levav, and Liora Avnaim-Pesso studied 1,112 bench rulings in a parole court and analyzed the level of favorable rulings throughout the course of the day. The study found that the ruling started out around 65 percent favorable at the beginning of the day and by the end of the day was close to zero. Their internal resources for making quality decisions had been depleted through fatigue as the day wore on, resulting in less favorable rulings by the end of the day

Another challenge for decisions is company size. "Internal challenges of large organizations are big barriers to decision making" according to an executive who runs analytics for a Fortune 50 company. She commented that it can take 1.5 years to get an insight to market due to the level of effort associated with disseminating the information throughout a large matrixed environment. The number of hops in the decisioning process impedes speed to market along with the degradation of the original intent of the decision.

How do we solve for these factors that influence our ability to make a quality decision? One way is to automate all or part of the decision process. Later on in their article, "Noise," the authors state:

> It has long been known that predictions and decisions generated by simple statistical algorithms are often more accurate than those made by experts, even when the experts have access to more information than the formulas use. It is less well known that the key advantage of algorithms is that they are noise-free: Unlike humans, a formula will always return the same output for any given input. Superior consistency allows even simple and imperfect algorithms to achieve greater accuracy than human professionals.

Our approach to driving the quality of the decisions higher in your organization is to create embedded analytical solutions to help managers make data-driven decisions of monetary value that generate action for their organization. There is an abundance of evidence to support our approach. In a study performed by Andrew McAfee and Erik Brynjolfsson, they found that "companies in the top third of their industry in the use of data-driven decision making were, on average, 5% more productive and 6% more profitable than their competitors."

Analytical Journey

Companies are at various stages in their analytical journey, with different levels of capabilities to develop analytical solutions. Over the past 10 years, companies have invested in building teams and leveraging tools to drive insights for a competitive advantage. Those that have progressed furthest are reaping the rewards.

A study on the maturity of analytics inside companies performed by the Harvard Business Review Analytics Services team found that "more than half the respondents who described their organizations as best-in-class also say their organizations' annual revenue has grown by 10 percent or more over the last two years. In marked contrast, a third of the self-described laggards say their organizations have seen either flat or decreasing revenues."

Study after study is finding similar results; companies that leverage data to drive the performance of their organization's decisions are winning at a faster rate than their competition. However, the technology behind most analytical applications is still nascent and lacks the functionality to deliver a complete solution. In an article by Harvard Business Review Analytics Services team, "Analytics That Work: Deploying Self-Service and Data Visualizations for Faster Decisions," they found in a survey of over 827 business managers that there is a sense of frustration with the lack of tool capabilities.

> "Most reporting tools on the desktop only scratch the surface," says Mier of Contractually. "They have limitations in understanding the underlying data structure, so they have not come close to fulfilling their promise. As a result, companies lack a framework for taking a complex issue, forming a hypothesis, and understanding the layers of data."

This is compounded by the fact that most of these solutions simply help managers "read the news," which means that there is nothing actionable about the data presented, it is just informative. The elusive goal to "manage through exception" is still no closer if you rely solely on technology to provide you this functionality.

Solving the Problem

The purpose of this book is to enable you to build analytical solutions that help managers and executives navigate through the sea of data to make quality decisions. However, this process is fraught with challenges. The first challenge is to distill the flood of information. We have a step-by-step process that takes you from hypothesis to data to metrics to building an analytical solution. We provide techniques to guide an executive through the difficulty of making a decision without influence from bias or noise.

This process is guided by your monetization strategy, where you build decision matrixes to make economic tradeoffs for various actions. Through guided analytics, we show you how to build your analytical solution and leverage the disciplines of UI/UX to present your story with high impact and implement dashboard development to automate the analytical solution.

Lastly, we will provide advice on enabling the solution within your organization through internal capabilities, organizational structure, and adoption techniques. Our methodology, Decision Architecture, provides an approach to solve each of these challenges and build analytical solutions that will help your organization monetize its data.

The real power of our method comes from tying together a set of disciplines, methods, tools, and skillsets into a structured process. The range of disciplines include Data Science, Decision Theory, Behavioral Economics, Decision Architecture, Data Development and Architecture, UI/UX Development, and Dashboard Development, disciplines rarely integrated into one seamless process. Our methodology brings these disciplines together in an easy-to-understand step-by-step approach to help organizations build solutions to monetize their data assets.

Some of the benefits you will receive from this book include:

- Turning information assets into revenue-generating strategies
- Making your organization more competitive through analytical solutions centered on monetization strategies linked to your organizational objectives

- Empowering managers with analytical solutions for better quality decisions
- Providing a guided experience for the manager that helps reduce noise and cognitive bias
- Increasing the analytical maturity of your organization
- Utilizing embedded analytics to gather the collective wisdom of your organization into a reusable analytical solution
- Turning your analytics into actionable tactics versus simply "reading the news"
- Monetizing your data to drive revenue and reduce costs

This book is not about selling your internal data to other companies or consumers. Nor is it a deep dive into each of the various disciplines. Rather, we provide you with an overview of the various disciplines and the techniques we use most often to build these solutions.

The Survey Says …

To ground our approach, we performed extensive research into each of the various disciplines. In addition, we interviewed and surveyed over 75 professionals in the analytical community in over 40 companies ranging in size from Fortune 500 to companies with under $100 million in revenue. The results speak to some interesting insights.

The first insight we gained is that the level of maturity for the organizations we surveyed is progressing nicely up the analytical maturity curve. Most organizations fall into the Statistical Modeling level with some firms starting to dabble in greater capabilities. Figure 1.1 shows the levels of maturity mapped to response.

We noticed a variety of insights based on an organization's size. Larger organizations have come to expect less precision when considering their average decisions. This insight was summed up by an executive at a major telecom company who said his people know that he is perfectly satisfied with directional accuracy. He would rather the analytics be 70 percent accurate and actionable than 100 percent accurate and too slow to market.

Midsize organizations were more likely to respond that they have more advanced capabilities. When asked questions about certain capabilities, the midsized companies had an above-average score, greater than larger companies. In Figure 1.2 on the impact of data science in their organization, small companies had an average score

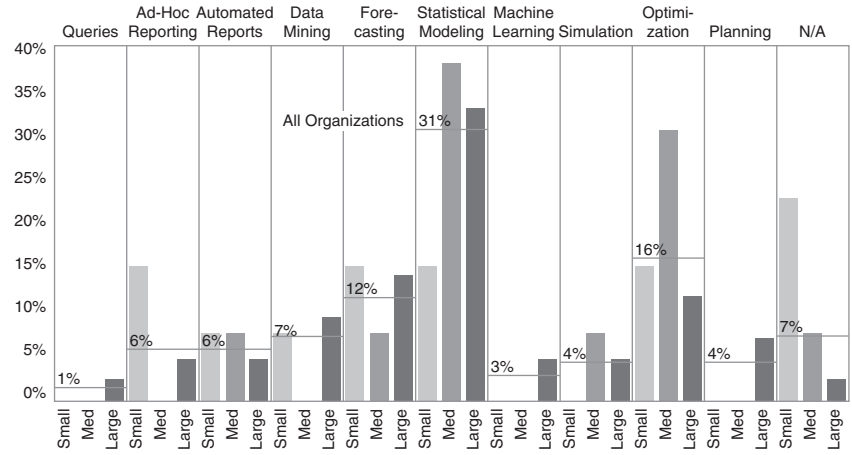

Figure 1.1 Data Science Maturity

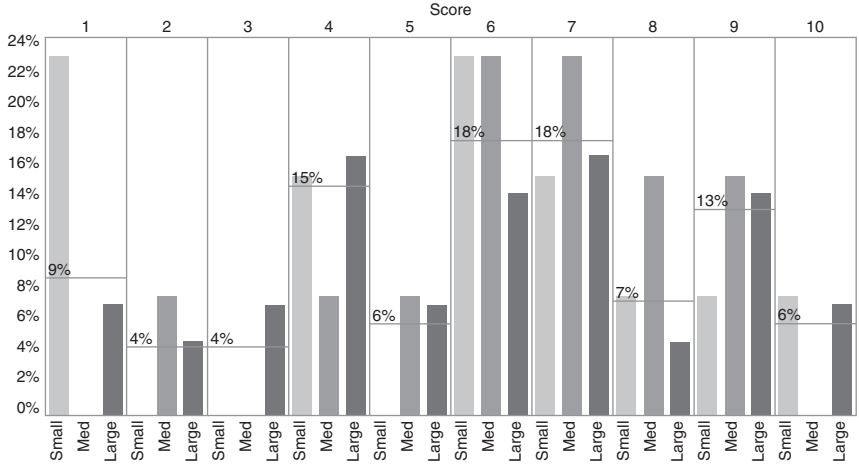

Figure 1.2 Data Science Impact

of 5.38, large companies had an average score of 5.81, and midsized companies had an average score of 6.46.

This insight speaks to a general trend we are seeing in the marketplace that the competitive advantage of large companies with respect to the use of analytics is disappearing as the cost of accessing,

processing, and housing data along with the costs of analytical tools has decreased to level the playing field. A company no longer has to have large teams of data scientists and millions of dollars to drive insights. Quality tools to mine data are now virtually free. Large communities have sprung up to drive innovation within these tools, providing capabilities to the average company that were not possible 10 years ago. This leveling is providing even the smallest of companies with capabilities that were previously available only to those large enough to afford them.

Another interesting insight came in the use of the various *dashboarding* capabilities by organizations. We found that most companies self-selected that they are utilizing dashboarding tools, but mostly as informational. They are not using advanced techniques to drive revenue through capabilities such as *guided analytics* or *decision matrixes*. Figure 1.3 is a graph of individual capabilities and usage.

Our research further validates that analytical dashboards are producing metrics, but not guidance and structure to interpret the information to drive action. From our respondents, approximately 80 percent have metrics, trends, and graphs, but only 15 percent have guided analytics, decision matrix, diagnostics, thresholds, correlations, monetization strategies, or models imbedded. These important capabilities that help guide a user through a decision process to make a quality decision are still nascent in most

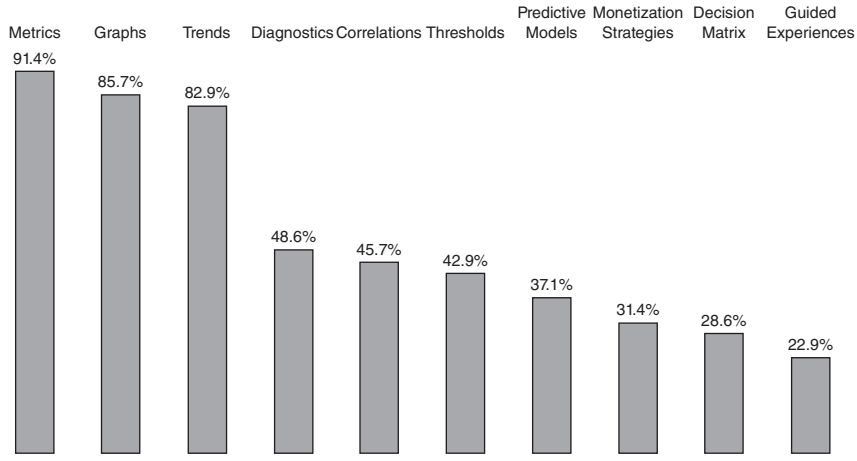

Figure 1.3 Capabilities for Respondent with Higher Data-Driven Decisioning

organizations which further validates the need for the methods, tools, and techniques we prescribe in this book.

Our research, survey, and interviews confirm our hypotheses and validate our experiences of the current state of analytics in most companies. Let's now turn our attention to utilizing this book to solve these challenges and close this gap.

How to Use This Book

The book provides you with the tools and methods to monetize your data through capturing requirements, building monetization strategies, and developing guided analytical solutions. The book is divided into several sections, each dedicated to a particular capability. Depending on your role, you may want to focus your time on a particular section to assist in building your strategy and solutions. For example, if your role is to help drive requirements for analytical solutions, you will want to focus on the Decision Analysis section of the book to implement in your organization.

Let's cover each of the sections in turn:

Introduction

Outside of this chapter, the first section starts with a discussion on the Analytical Cycle. The Analytical Cycle provides you with a frame of reference for how to think about solving analytical problems and the steps for each stage. The cycle flows from the business problem statement through the questions you ask yourself to understanding the root cause of an opportunity or issue. It then drills into diagnostics to help determine decision options that lead to actions and finally the need to measure your results.

In this section we also introduce the methodology of Decision Architecture, as presented in Figure 1.4. It is your step-by-step process guide as you build your solution. It is divided into five phases, each with tools and techniques to make you successful. The steps in the methodology serve as the foundation for the book and tie each of the chapters together.

The methodology has five phases: Discovery, Decision Analysis, Monetization Strategy, Agile Analytics, and Enablement. We view

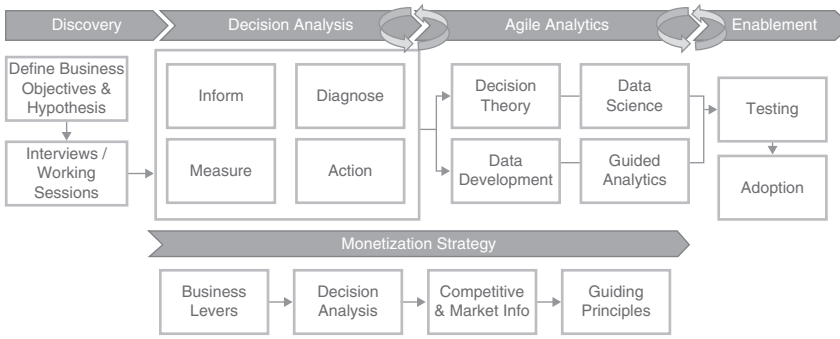

Figure 1.4 Decision Architecture Methodology

each of these components, techniques, and tools in the methodology as Lego™ pieces that you can choose from when assembling your analytical solution.

Decision Analysis

The Decision Analysis section focuses on the techniques that can help you architect a decision and translate these into requirements. This phase of the methodology produces a set of requirements that translates the business problem from a hypothesis to the questions, decision, actions, metrics, and data needed to build your analytical solution.

Monetization Strategy

The goal of this section of the book is to empower you with the tools and techniques necessary to create winning strategies for your company. The four components of developing your Monetization Strategy are: Monetization Guiding Principles, Competitive and Market Information, Business Levers Framework, and the requirements gathered from the decision analysis. Depending on the type of strategy you are developing, you will need each of these in varying degrees. Lastly, in this section we have a chapter with an example of building a monetization strategy.

Agile Analytics

The next section of the book is dedicated to building your analytical solution and is the largest section of the book. This section has several components, including Data Development, Guided Analytics, User Interface (UI), User Design (UX), Decision Theory, and Data Science. In this section you build your analytical solution informed by the requirements from decision analysis and monetization strategies.

Guided Analytics is a combination of disciplines that include Dashboard Development and User Interface development. These chapters cover the importance of UI/UX and the role it plays in making your solution user friendly.

This section also covers data development and building analytical structures to support your solution and deliver performance. Lastly, in this section we cover decision theory and data science. These chapters provide a base understanding of the tools you can leverage in each of these disciplines and how to deploy them in your solution.

Enablement

The final section of the book covers topics on the enablement of the solution and the analytical organization. We start this section by covering the iterative development process and inclusion of end users in the effort to build the final product. This section then goes on to address several key questions: How should you roll out the solution? What type of team will you need to stand up in order to develop these solutions for your organization? What types of skillsets are needed? How should it be governed? What type of mindset should the team and organization have to be successful? As you develop your team, this chapter serves as your guide for the various disciplines needed.

Case Study

Finally, we bring all of the methods together to look at a case study on Michael Andrews Bespoke, a custom tailor headquartered out of New York City. Through this case study, we show how the techniques we present in this book help the company build engagement and retention monetization strategies to drive revenue. This real-world example brings many of the techniques to life and provides a great reference for you as your build out your analytical solutions.

Let's Start

Let's start our journey together. By going through each of the chapters you will develop the knowledge to drive significant revenue for your organization. We have been building analytical solutions for over 20 years, helping organizations monetize their information. We hope by sharing our insights and collective wisdom, you will be able to build world-class analytical solutions that help your organization drive a significant amount of revenue and become a better competitor.

We have a companion website, www.monetizingyourdata.com, to continue the dialog with you during and after you read this book. We have exercises to help drive home the concepts along with additional tools, templates, and methods. Visit us and utilize one of our existing tools or post a best practice of your own.