



Best Practices in Data Analytics

How Organizations Realize
Value from Analytics

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About this Report

This study profiles the best practices of organizations that have successfully applied analytics to their businesses. The objective is to help business and technical managers understand current best practices for delivering analytics that generate value.

We conducted interviews with three organizations across different industries to learn best practices for how analytics contributes to business value and to synthesize these practices into a set of value drivers. The results suggest that executives should create an analytic value strategy to manage the business value for their analytic systems.

About the Methodology

The methodology for this study is to report accurately and objectively on the experiences of pioneering companies, based on one-hour interviews with knowledgeable participants. The goal is to contribute to professional education—to share experiences and best practices with other professionals so that we can mature as an industry, amid escalating business challenges and rapidly evolving technology.

We appreciate the insights shared by the professionals who were interviewed. We also appreciate Teradata Corporation for sponsoring this study and for permitting open and independent access to its customer community.

About the Author



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Dr. Hackathorn is a well-known industry analyst, technology innovator, and international lecturer in business intelligence and data analytics. He is currently focusing on the managerial challenges of analytic systems at scale, as enabled by neural networks. He is also pioneering an emerging area called immersive analytics. He has published three books, numerous articles, and dozens of educational case studies on innovative business systems. He was a professor at Wharton School of the University of Pennsylvania and the University of Colorado. He received his degrees from the California Institute of Technology and the University of California, Irvine.

About Eckerson Group

[Eckerson Group](#) helps organizations get more value from their data through research, consulting, and education. Our experts each have more than 25+ years of experience in the field, specializing in business intelligence, data architecture, data governance, analytics, and data management. We provide organizations with expert guidance during every step of their data and analytics journey. Get more value from your data. Put an expert on your side. [Learn what Eckerson Group can do for you!](#)



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Introduction

This study examines the strategies that guide organizations to invest and apply analytics to improve their businesses. This strategy is often hidden within a complex IT infrastructure of diverse technologies and oversimplified as “becoming more data-driven” or “generating more insights from data.” But the technology and practice of data analytics have become too important to the success of companies for such simplistic statements.

As our interviews with three organizations reveal, the power of analytics is evolving rapidly to cause several fundamental shifts. Sophisticated use cases are being enabled on a global scale. A few useful insights per week have become thousands of actionable decisions per minute. Small, isolated applications are now part of large, pervasive systems. These shifts require organizations to enhance the management of their entire analytic life cycle, plus deal with new challenges (such as privacy) for realizing tangible economic value from analytics.

Hence, our focus in this report. What are the emerging best practices for realizing value from analytics?

ANALYTIC VALUE CHAIN

The framework used in this study is based on the following economic principle:

Analytics has economic value when it enables organizations to make choices whose actions yield better outcomes compared to choices made in the absence of analytics.

In other words, analytic value is the difference between using analytics versus not using analytics within a specific business situation. To measure that value, one must determine the

business value of the outcome with and without analytics.

The analytic value chain (AVC) transforms data into choices. Decisions are made by managers to execute, resulting in desired outcomes (see Figure 1).

The key elements of this AVC include (from left to right):

- The clouds are a single **use case** that describes and resolves problems within specific business situations.

Figure 1: The Analytics Value Chain

Data is transformed into choices, then actions, which drive desired outcomes.

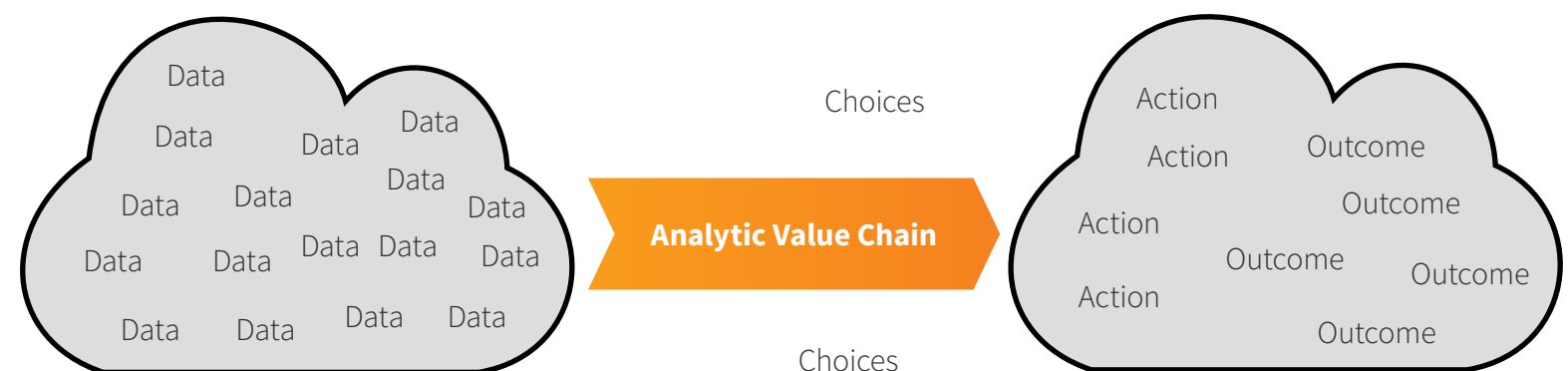


FIGURE 2: THE ANALYTIC VALUE CHAIN IN DETAIL

The AVC finds the right signal within data.



- The **data** drives the AVC. Hence, data quality determines analytic quality.
- The **AVC** is a hierarchy of capabilities where previous capabilities enable successive ones.
- Analytics transforms data into **choices** that specify certain actions within the business situation (cloud).
- Through its policies, the organization decides which choices to execute, resulting in **actions**.
- The actions cause certain **outcomes** within the business situation, affecting future data.

Let's take this AVC to a deeper level of detail (see Figure 2), relevant to the organizations interviewed for this study. In contrast to usual data flows, the AVC is a chain. If a capability is absent, the chain is

broken, reducing the analytic value realized by the organization.

The additional elements are:

- Five generic sequential **capabilities** of the AVC:
 - **Acquire and curate.** Acquiring data is the start of the value chain, requiring ongoing curation selective for its eventual purposes.
 - **Select, transform, and blend.** Data becomes useful when it is selected from large data sets, transformed to standard formats, and then blended with other data.
 - **Explore and describe.** This is the fun part: discovering what the data looks like, exploring its implications, and then describing it to

others. It implies: "This is what happened; make your conclusions."

- **Generalize, infer, and decide.** The next step is to generalize, which deals with statements such as: "This is what will likely happen (predict)," or "This is expected in this situation (infer)." Both are important contributors to business value.
- **Operationalize and govern.** Deploy all prior capabilities at scale in operational systems, and govern operations to ensure proper results.
- **Insights** are formalized statements of causal relationships to formulate the choices for action.
- **Guesses** are informal statements indicating that certain correlations among variables/features

might be relevant to understanding useful causal relationships.

- **Hunches** are very informal statements that raw new data might be useful to investigate further and could be worth curating into the data warehouse for operational usage.

The AVC is a complex chain. Its purpose is to find the right signal within data that will generate choices whose actions yield better outcomes for the organization.

ANALYTIC VALUE DRIVERS

When we analyzed the case studies that follow, seven value drivers emerged that yield insights into how analytics contributes to economic value for these organizations. These value drivers (labeled with V tags) are listed here, along with the companies (C tags) where each driver was documented:

V1 Data-driven culture emanating from the top. Being data-driven implies basing decisions and business processes on data balanced with seasoned intuitive reasoning. The realization of analytic value depends directly on whether an organization is data-driven. This culture starts from the top and cascades down to all levels. It also implies constant innovation (trying new approaches and technology). **[C1, C2, C3]**

V2 Pervasive data literacy. A data-driven organization features pervasive data literacy. Everyone should understand basic terminology and know what is possible with current analytics. Further, many key constituents should be able to use and operationalize analytics into routine processes. **[C1]**

V3 Searching for the signal. The “signal” is the specific data that enables the relevant causal relationships to be inferred. Analytics is a search for the why. It is more than correlation and pattern detection; it resembles the thinking of an investigative detective at a crime scene. The mystery of the business situation is the heart of generating passion for being data-driven. A detective never assumes the signal is included in data that is already known (such as data that is already in the data warehouse). New data may likely be required, along with an extensive search among complex data relationships and time sequences. **[C1, C3]**

V4 Effortless customer interactions. The customer experience should be as effortless (seamless and frictionless) as possible. For example, a product or service offering should require only the touch of a customer’s

smartphone. An interesting technology—chatbots—has become practical on apps and websites to solicit richer data from customers in a relatively effortless manner. **[C1, C2]**

V5 Inclusive data ingestion. With reliable and cheap massive object stores from cloud providers, the analytic data pipeline is being simplified with a single common land to capture all raw data, which is curated into the data warehouse and other systems as priorities and resources dictate. Besides solving data retention and data recovery issues, this also enhances the curation of new data to aid V3 (searching for the signal). **[C3]**

V6 Social issues. A variety of social issues are part of current business reality and must be part of the analytics that attempts to make sense of that reality. This is a wake-up call for techies! With plenty of technology, the problem is not what we can do, but what we should do. Next-gen analytics will enable solutions for real problems that we have yet to imagine. An example is the unethical bias in analytic results based on gender, age, and race hidden within model training procedures. How should we govern this problem? **[C1]**

V7 Complete data lineage. Knowing the usage and source of all data items is essential when analytics guides actions that have a significant impact on people. Understanding data lineage is the first step toward the difficult

task of explaining the results generated by analytic models. [C1]

The next section of this report—Case Studies—documents the experiences of the three

organizations we interviewed. In the Conclusion, we will revisit the AVC as part of the analytic value strategy for organizations in general.

Case Studies

To explore these issues, we interviewed three organizations at the Teradata Universe 2019 conference about their experiences in realizing business value from analytics. These organizations represent companies of various sizes and industries globally, along with different business challenges (see the table below). The common characteristic is that they employed Teradata Vantage™ for critical business initiatives

supporting their analytic processes. Because of the sensitive nature of this information, the organizations and interviewees are anonymous.

The following case studies document the challenges, problems, solutions, and value for each of the three organizations. We have used V tags to reference the value drivers and C tags to indicate the companies.

ORGANIZATION		CHALLENGE
C1	Entertainment Conglomerate	Manage a conglomerate in automotive, sports, entertainment, and real estate industries.
C2	E-Commerce and Internet Conglomerate	Provide online travel services globally.
C3	Package Delivery Company	Provide efficient and reliable package delivery services on a global scale.

Entertainment Conglomerate [C1]

This company spans several interrelated businesses involved with automotive, sports, entertainment, insurance, and real estate across a large region. The focus of this interview is the use of analytics within its sports and entertainment group.

PROBLEM

C1’s mission is to create memorable entertainment experiences for its customers across many venues. To accomplish this mission, the company focuses on implementing seamless and frictionless interactions with customers.

For instance, C1 wants to avoid segmented experiences that depend on whether interactions happen via smartphone or kiosk. If customers buy tickets to a sporting event, parking directions should be added to the app, along with food recommendations at the venue.

“The whole experience for customers should feel seamless and frictionless.”

SOLUTION

To solve these problems, the company concluded that, to realize the value of analytics, it is imperative to be data-driven as a business. [V1]

In the interview, the challenge to become data-driven was described using the analogy of a remote town in the 1880s. Such conversations often occur when non-technical managers are shown how analytics could impact their group. Sometimes the differences in culture and perspective can be immense, eliminating the basis for collaboration.

“It starts at the top ... their CEO is data-driven with certain KPIs that are used to manage the business. This mentality is naturally pushed down to reporting managers to understand and accurately report their progress. However, being data-driven is a big challenge for any organization.”

Over the last three years, some groups have caught the data-driven vision, such as the following examples:

Optimizing season ticket pricing. A group recently analyzed the purchasing behavior of season tickets for the expensive stadium seats. The regular fans usually purchase several season tickets, attend most games, and transfer a few tickets to others. In contrast, there are large bulk buyers who resell season tickets to fans at a higher price, who then flip the tickets to other fans at even

CHALLENGE
<ul style="list-style-type: none">Managing a conglomerate in automotive, sports, entertainment, insurance, and real estate
PROBLEM
<ul style="list-style-type: none">Providing great memorable experiences in entertainment and sportsProviding seamless & frictionless interactions with customers
SOLUTION
<ul style="list-style-type: none">Data literacy for everyone in a data-driven companyFocused analytics with clear data lineageAttention to social issues involving customers
VALUE
<ul style="list-style-type: none">Driving customer behaviorSustained customer loyalty across venues

higher prices, until the unfortunate fan who actually attends the game and cheers for their team ends up spending considerably more for their ticket.

This is unfair to the actual fans, so the company is raising prices on bulk tickets with the intent to lower the prices for the actual fans. This is a tricky balance, only enabled by the right analytics. [V3]

Handling privacy and other social issues. There are social concerns about protecting the privacy of fans. One fan would not give any personal information to anyone and does not want a photo taken. Most other fans don't care at all. How can C1 create great experiences while properly catering to individual privacy concerns? [V6]

This is a general problem for using analytics across all consumer-oriented industries. The existence of the EU General Data Protection Regulation (GDPR) demonstrates that people want more control over the use of their personal information.

Personalizing services via facial recognition.

C1 is considering the use of facial recognition for its premium guests, a capability that would allow a more personalized experience. A prototype worked amazingly well. The following quote illustrates the give-and-take, back-and-forth discussions required for this kind of analytic innovation:

“When this idea was presented to the marketing group, they liked the idea, but the legal group did not for fear of libel suits. Later, the idea was to have the fans submit their photos, and we would match their image to the closest professional player. Neat idea, but we realized that people would also submit photos of their pets, fruit, and even body parts, which would obviously appear unfavorably in social media. So, the idea was tabled once again.”

Securing venues against an active shooter.

Another use case is the possibility of an active shooter situation at one of their venues. Here, a facial recognition capability could be used for security. If the company is open and honest about using facial recognition to ban certain people from their venues, then the public could be more willing to accept this new surveillance capability. If so, would it also be appropriate to use facial recognition for non-security uses? This issue is at the heart of the trust factor between the company and its customers.

These innovative use cases for analytics have complex legal, political, social, and ethical issues. C1's advice was: Don't let the excitement diminish the deep thought required to recognize these social issues and use analytic technology accordingly.

Need for data literacy. Becoming data-driven as a company requires educating everyone in the organization with a basic understanding of what is possible with current analytics and how to use its enabling technologies. C1 is performing innovative analytic artificial intelligence (AI) initiatives that predict great things. However, if nobody knows how to operationalize and use the analytics, there is no business value. [V2]

“[It is necessary] ... to educate everyone in the organization with a basic understanding of what is possible with current analytics.”

Developing data literacy must start with teaching the language of data. For instance, understanding web traffic requires that a person know the difference between a “visit” and a “session.” What is A/B testing, and when do you reach statistical significance to decide on an action? The company is establishing a data institute to complement its existing leadership institute.

Maintaining data lineage. The company maintains data lineage, both in terms of where the data comes from and where the data is consumed. If the IT staff finds problems with source data, they can determine how it might impact customers. If they find problems with service to customers, they can determine if the source data was valid. The company is continuing to build out this data lineage capability. [V7]

VALUE

When asked about the value from analytics, C1 noted the efficiency of using IT resources as aided by analytics.

Changes in customer behavior. C1 once estimated the cost of a single report as several

thousand dollars, which did not justify its ROI in terms of numbers. However, the company continues to add infrastructure and is investigating an additional value metric: whether the analytics (as reports or as visualizations) drives changes in customer behavior. For instance, a loyalty program was being measured by the number of customers registered. But the key question was whether customers were behaving differently. They discovered that customers on the loyalty program attended one more show per year, on average. At

an estimated additional \$15 per customer and with 100,000 loyal customers, the program is driving \$1.5 million of additional revenue. **[V4]**

The key question [to determine the value of analytics] was whether customers were behaving differently.

Innovation fund. Based on these benefits from analytics, the company has allocated some budget for innovation. Teams use these funds to try new

ideas. Half of them fail, but some teams create tangible value and actionable drivers. A percentage of that value is returned to the innovation budget so teams can do more innovating. The company concludes that analytics should be grown organically and demonstrate value incrementally, thus avoiding massive projects that are often wasteful. **[V1]**

E-Commerce and Internet Conglomerate [C2]

This e-commerce and Internet conglomerate is a global innovation company encompassing a large number of services in a few dozen countries. The company’s corporate strategy is to do service innovations through the smart use of data. The travel services group (C2) leverages the global brand identity as part of this innovative company.

This case focuses on the Travel Services provided by a group within this global innovation company. Its challenge is providing full multi-lingual online travel services globally. These services involve offering complete travel packages with flights, hotels, car rentals, bus reservations, and local tourism planning, all in seven languages.

“[Their] corporate strategy is to do service innovations through the use of data.”

PROBLEM

C2 described two specific problems: placing web advertisements and personalizing customer website experiences.

Optimizing web and strategy. The travel services group was able to analyze the cost, volume, and placement of their external web

travel advertisements in comparison to their effectiveness with customers so they could optimize the placements. Hence, they were able to reduce their marketing costs while improving their marketing value.

Personalizing website experiences. The travel services group wants to analyze customers’ past travel bookings data as well as behavior data from the access log on their online reservation system. The goals are: (1) increase the number of travel services customers book, (2) increase the conversion rate of customers browsing different travel options, and (3) predict the likely future travel needs of customers so recommendations can be emailed to them after they have left the website without a purchase.

SOLUTION

The heart of their analytic solution for the online travel service system is the analytics platform, which is being deployed specifically for its purpose. At its center, Teradata Vantage™ enables the data science team to use a uniform SQL interface to easily use various analytic functions against various data systems, such as their corporate-

CHALLENGE
<ul style="list-style-type: none">• Provide full online travel services globally
PROBLEM
<ul style="list-style-type: none">• Integrate large and diverse data sources• Apply descriptive and predictive analytics
SOLUTION
<ul style="list-style-type: none">• Agile analytics with strong data integration
VALUE
<ul style="list-style-type: none">• Personalization of travel experience, focusing on enhancing travel planning

wide Teradata Data Warehouse, Oracle® Exadata, MongoDB, and Hadoop Data Lake. As the interconnect, Teradata QueryGrid™ minimizes data movement and duplication, processes the data on the platform where it resides, and balances data transfers by pushing down processing to the various platforms.

With the analytic solution, their data scientists are able to use a single SQL statement to efficiently integrate data from various platforms and perform advanced analytics without assistance from

data engineers. Marketers responsible for their travel packages are then able to perform prebuilt business intelligence (BI) analysis by themselves, using tools like MicroStrategy and Tableau Software.

They have a dedicated team of ten data scientists, along with a sophisticated analytics platform. Another intangible part of their solution is the passion of the team, which they deemed important for support and direction from their management. Along with this passion, the desire to innovate by trying new approaches was also critical to their success. [V1]

VALUE

When asked about the value gained from analytics, they noted that top management understands that they must invest in data analytics capabilities. Customers will be motivated to buy their services because of the conveniences that analytics enables. [V1]

“We enjoy the ROI advantage of increased revenues enabled by the analytic capability that exceeds the expense of these investments, such as better personalization of the travel planning experience for customers.”

Future plans. The value stems from the company’s investment in both data analytics

and in the team using those capabilities. During the interview, it was apparent that the team’s passion for pursuing business objectives and their maturing analytic skills are driving the value generation.

The travel services group has two major objectives—short-term and long-term—to enhance their analytic capabilities. The short-term objective is to increase revenues through better personalization of the travel planning experience for customers. Operationally, this is done by increasing the conversion rate of the customers purchasing recommended services identified by machine-learning algorithms.

The long-term objective is to make their website innovative so that customers think, “This service is more than just a booking site; it knows my travel needs.” In other words, their website should identify what a specific customer wants for their travel experience and then assist them in their planning. They are introducing a chatbot technology to stimulate conversations about their desired travel experience. Initially, the chatbot will be used to handle the normal travel questions, about reservation cancellations and hotel arrival times. This will reduce the cost of customer service. In the future, they want to

extend their recommendations beyond just using the travel history and online behavior data. They want to incorporate information derived from the customer-chatbot conversation. For example, the customer may converse with our chatbot “My friend had a great time in France, and I am now interested in France.” Based on insights from this current behavioral data, they will revise the travel recommendations for this customer. [V4]

Their plans have proceeded well over the past years, especially with improved ROI from their travel personalization efforts. They attribute this value to their new Teradata Vantage™ system.

“The short-term objective has already improved our ROI of the personalization investment, especially because of the new capabilities of the Teradata Vantage™ system providing faster and easier access to the data.”

Package Delivery Company [C3]

An international courier delivery services company known for its innovative systems for tracking packages and providing real-time updates. Its challenge is to provide efficient and reliable package delivery services on a global scale.

PROBLEM

With increasing volume and opportunity demands for its services, the company needed to manage massive streams of diverse data that are constantly changing and make the data accessible for analysis with diverse requirements.

Typical use cases for data analysis include:

- Comply with regulatory requirements to maintain data for a specific period.
- Provide the business with access to historical data for year-over-year comparisons.
- Provide data access to historical data to a wider audience.
- Retain all historical data, not just specific archive tables.
- Provide a simple way to view data using SQL queries before loading into applications.

SOLUTION

Definition of analytics. When asked for the definition of analytics in their company, they answered that analytics should provide a causal explanation of why something unusual happened. This explanation enables them to ask questions that are predictive (what will happen?) and prescriptive (what should happen?). [V3]

“The term analytics is a loaded one! Depending on who you ask, there are many definitions. To me, analytics is telling me why something happened outside of my normal [expectations].”

For instance, the on-time delivery of packages is critical. Hence, their analytics focus on many use cases to understand the causal dynamics of the why about deliveries.

“We have done analytics to better estimate the time of delivery and then notify the customer when to expect their package. We are still working on analytics that will note when our estimates are wrong and why the specific delays occurred.”

Purpose for analytics. When asked about the purpose of analytics, the answer centered on analysts solving specific business problems. To be useful, the data should verify the problem, and visualizations should show the problem from the data. [V3]

CHALLENGE
<ul style="list-style-type: none">• Provide efficient and reliable package delivery services at a global scale
PROBLEM
<ul style="list-style-type: none">• Manage massive streams of diverse data from operations
SOLUTION
<ul style="list-style-type: none">• Inexpensive, secure, and simple mass storage integrated with an analytic exploration platform and logical data warehouse
VALUE
<ul style="list-style-type: none">• Generate analysis results that answer ad hoc business questions quickly and accurately

“Where’s the data? Can you show me this problem [in the data]? To be useful, visualizations must immediately show you whether there is a problem or not.”

Optimizing promotions. One use case supports marketing analysts who look at customer trending patterns, answering questions such as: “Why did this promotion generate an upward trend, but a similar promotion did not?”

Handling unusual demands. Another use case involves hub engineers who notice an unusual volume of packages coming. They need to estimate how many employees are required for sorting to maintain the schedule for that hub. This analysis requires knowing the timing of the incoming packages and whether the right people are scheduled to work at that time. [V3]

Improving logistic processes. A final use case involved solving a specific problem with packages moving unusually slowly through customs. The analyst was able to search the data, find the problem, and determine a modification to the company's processes to resolve it.

Organizing analytics. Their Data Warehouse group was reorganized into the Big Data group and then into the current Data Analytics, Warehousing, and Governance group. The group is now responsible for enterprise analytics and is prescribing the proper ways to do analytics throughout the company. The goal is to push analytics out to business users by standardizing toolsets and pipelines so users can build models, train them, and then deploy them efficiently and effectively.

The first task was to redesign data ingestion at the enterprise level. Massive data comes from diverse

sources, all of which are constantly changing in volume and structure. The problem was to handle all this data so it gets into the right system at the right time.

Common landing zone. Their solution is to capture all incoming raw data in a common landing zone and then curate and move it into the data warehouse and other systems as priorities and resources dictate. This landing zone needed to be accessible by multiple systems and retain much more data. Today, the landing zone for all data simplifies and standardizes the entire data ingestion process, increasing reliability. [V5]

The solution incorporated the Native Object Store capability within Teradata Vantage™, which allowed the company to use object store services from any cloud provider, such as that of Google Cloud Storage or Microsoft® Azure Blob.

The company is now able to retain massive amounts of data inexpensively and has enterprise-class scalability, availability, security, and performance. The data is easily accessed by a variety of open-source tools, along with other multiple large systems.

VALUE

When asked about the value from analytics, they noted that analytics is aiding the company by streamlining corporate policy changes, improving the broad usage of analytics, and ensuring solid data disaster recovery.

Policy changes. Solutions sometimes involve policy changes that impact several organizational processes and require executive action. The analyst usually creates a visualization showing the unusual data patterns, which drives discussions throughout the organization: down to the data sources for verification and up to executives for decisions. [V1]

For example, a route optimization problem was identified because of future road construction that would last for three months. The route for package delivery had to be completely reconfigured, requiring coordination among several groups.

Common landing zone. They pointed to creating the common landing zone for data ingestion as a critical step in the analytic value chain. Because subsequent analytics can be performed more easily and quickly, a long-term multiplier effect is occurring across the entire chain. They also listed several added benefits:

- Providing more users with self-service analytical tools to access and analyze data quickly.
- Business insights into legal and fraud issues are now easier to obtain.
- Met corporate requirements for keeping data longer.
- Reduced the costs of maintaining multiple data archiving solutions.

Disaster recovery. A side benefit is that the common landing zone is now an important part of disaster recovery. The company is now able to go back and replay data from several weeks ago if critical disruptions occur with upstream systems. Because their primary backups are performed weekly, it was previously possible that up to seven days of data could go missing forever. Also, the company easily comply with a recent mandate by

their corporate legal group to retain all business data in case of future legal actions.

“In a real-time business like ours, this [data loss] is not acceptable.”

Conclusion

Executives can create a unique analytic value strategy (AVS) and instill an appreciation for the difficult organizational changes required. Here is how.

CREATING YOUR ANALYTIC VALUE STRATEGY

The analytic value chain transforms data into action according to the following economic value principle:

“Analytics has economic value when it enables organizations to make choices whose actions yield better outcomes compared to choices made in the absence of analytics.”

The AVC is a simple sequence of generic capabilities required for transforming data into action. Each step contributes value to better outcomes for the

organization. If the chain is broken, value suffers. In practical situations, the chain must be customized for each organization and expanded across various business use cases for analytics. The result may be a complex hierarchy of capabilities.

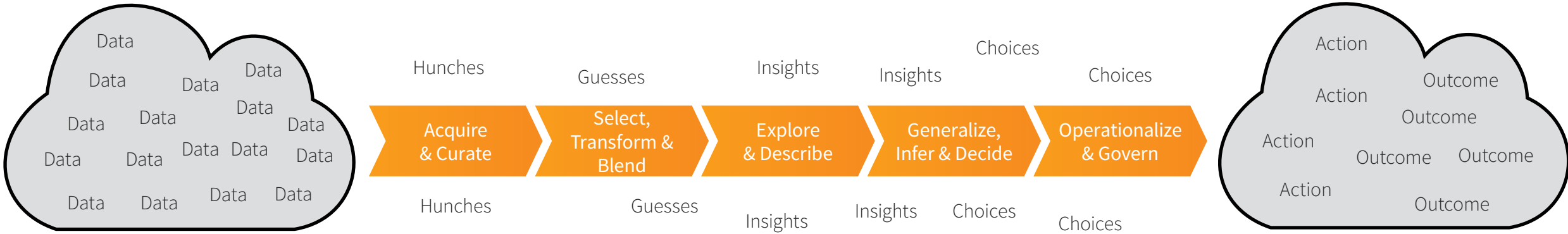
Ideally, you should identify the desired outcomes, determine the actions that will produce those outcomes, and then transform data to generate the best choices for those actions. This sounds simple to implement, but it can be challenging in practice.

Takeaway. Start on your AVC by forming a small team of talented business and technical managers across the organization. Give them two months

to create a thought paper following this line of inquiry. How do the possible scenarios blend existing culture and technology? What are the policy issues that must be resolved?

The success of your AVC depends on clear definitions for each of these aspects, plus creating the governance mechanisms to ensure compliance across the entire analytic life cycle (conception, design, development, testing, deployment, and operation).

This summarizes the strategy behind the AVC concept in a nutshell. Now, let’s probe into the cultural and technology changes required for successful analytics.



CHANGING YOUR CULTURE AND TECHNOLOGY

Seven analytic value drivers were critical to the organizations interviewed for this report. Let's consider what's required to enable these drivers to be effective in terms of changes to organizational culture and technology infrastructure.

Based on the three interviews, Figure 3 positions the analytic value drivers based on the cost and effort required for cultural and technological changes.

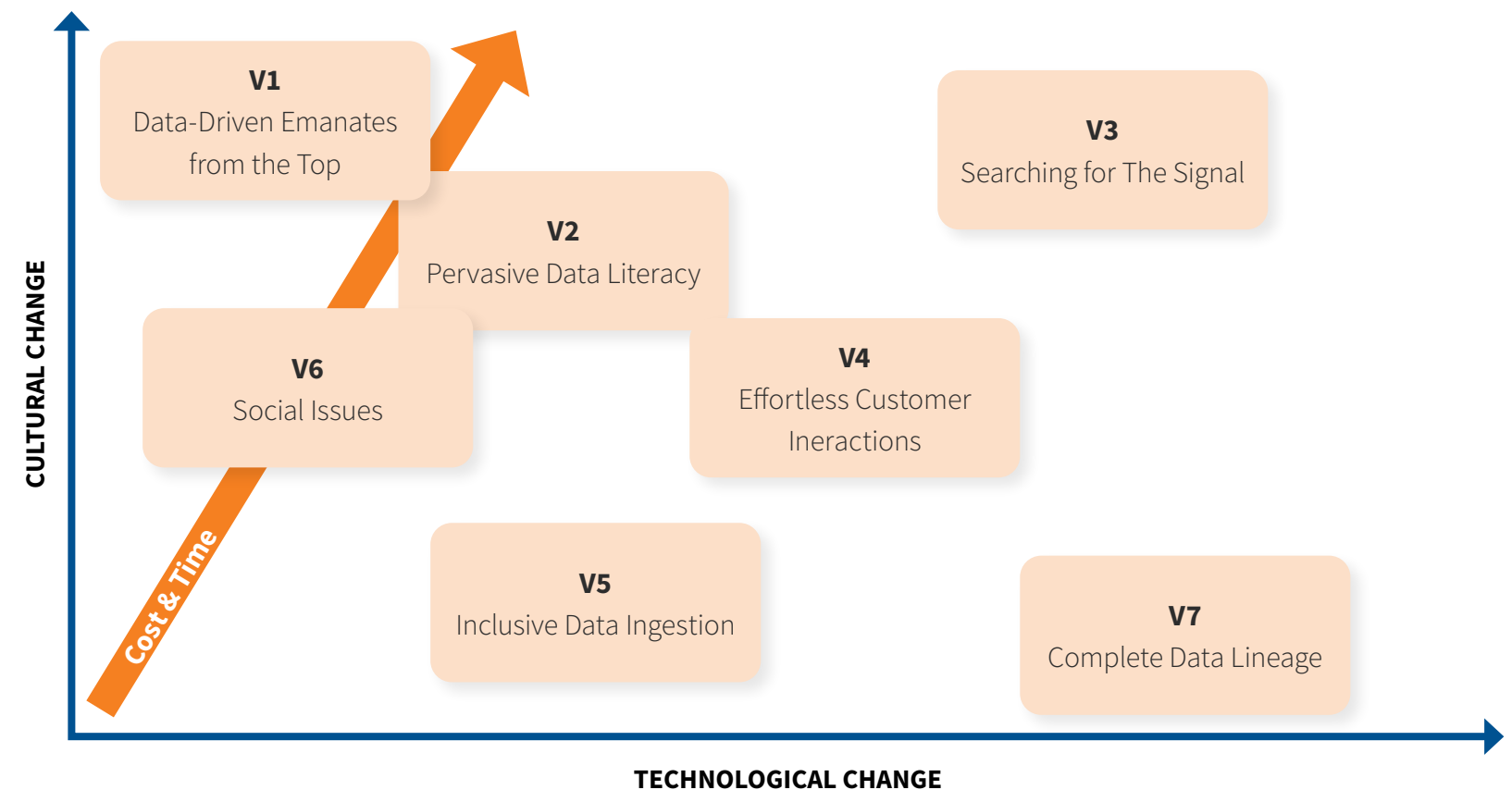
The value drivers require various changes in culture and technology:

V1 Data-driven culture emanates from the top. Top management attention is required throughout an analytic project, especially in the early stages of setting business objectives and expectations and in the latter stages of monitoring outcomes and realizing business value. Few technology changes are needed.

V2 Pervasive data literacy. This value driver is like the oil affecting every one of the AVS links. And every employee of the organization should participate. Analytics must be part of the organizational vision statement and a skill

FIGURE 3: CHANGING CULTURE AND TECHNOLOGY.

Analytic value drivers plotted by the cost and time required to make necessary changes.



expected of most employees. Everyone must speak the same language and be motivated in the same direction. To be a data-driven organization, everyone needs to be data literate. Technology must support and facilitate this literacy. Interactions must be easy to use and tutorial in nature. Collaborative BI techniques (such as sharing and commenting on analyses) are also essential.

V3 Searching for the signal. This value driver probably contributes the most value. True signals are elusive. Guesses, hunches, and even seasoned instincts are biased in unexpected ways. The passion behind the data detective mentality is a significant cultural boost. The challenge is that close coordination among both management and technical groups is essential for large-scale success. A

bunch of techies in the back room may have great data insights. However, the value comes from business insights based on an intimate understanding of business processes and customer behavior.

V4 Effortless customer interactions.

Understand thy customer! This doesn't just mean knowing what bugs customers about using your current systems. It means creating new interactions that make their experiences seem effortless and even fun. Lots of cultural savvy mixed generously with deep technical creativity is required.

V5 Inclusive data ingestion. This is initially a technical issue. It deals with new cloud-based services within an open, flexible infrastructure, which should simplify the data pipeline and reduce IT costs. If your organization isn't there technically, that's a problem. This value driver also assists with curating new and often messy data, which requires a large-scale system for soliciting and refining. It is data lakes reinvented.

V6 Social issues. This value driver deals with growing restrictions (and opportunities) on data usage in a complex global economy.

Dealing with the social issues related to analytics throughout the entire analytic life cycle is probably the toughest challenge that all organizations must now resolve. It means lots of coordination among all management levels, plus continual interactions with technical groups as technology improves. Unfortunately, new technology often creates new social issues to resolve, like the facial recognition problem in the C1 case study.

V7 Complete data lineage. This value driver contributes to resolving data problems that affect customers, such as tracking packages in the C3 case study. The problem may be anywhere along the data lineage, especially when analytic modules are sprinkled throughout. Legal issues of liability are increasingly risky and expensive; you may need to explain why your system performed an action that resulted in harm or loss to a customer. The ability to explain analytic results is getting better but is still opaque to most, especially to a jury in a courtroom setting. Data lineage is essential here.

The challenge for executives? Identify your unique value drivers and thoughtfully assess the cost and time required. Figure 3 outlines the implications of this challenge.

First, note that there are roughly three clusters of value drivers: those that are primarily cultural changes, those that are primarily technology changes, and those that are a mixture. The cultural value drivers will be the focus of top management, which must set visions and policies. The technology value drivers will be the focus of technical groups, which will design and implement the proper technology infrastructures. The third cluster is challenging because it requires close coordination among all levels and groups. Hence, these hybrid value drivers will be the most difficult to plan and execute.

Takeaway: Is your organization able to accomplish the required changes to make a value driver successful? Will this achieve the desired business objectives in a pragmatic financial manner?

Second, note that culture changes require more cost and time than technology changes. This implies that culture changes should have the immediate attention of top management early and be pervasive throughout the change process.

Takeaway: Is your top management willing and able to accomplish the required changes to make a value driver successful? Will this achieve the desired business objectives in a pragmatic financial manner?

Analytics forces organizations to reassess the accepted thinking and policies about their business systems. Executive attention is increasingly required to manage the strategy by which business value is derived from analytics, along with necessary changes to organizational culture and technology infrastructure. If an analytic

value strategy is well-executed, an organization will likely realize increased economic value. This could initiate the revitalization of their organization and even the redefinition of their industry.

In memory of Clayton Christensen, a final conclusion implied within these case studies is to

remember that innovation (especially as driven by analytics) can be highly self-disruptive. Understand the dilemma of the analytic innovator role. Learn from the experiences of formerly great companies like Xerox. Understand the principles behind disruptive innovation.

About Eckerson Group



Wayne Eckerson, a globally-known author, speaker, and advisor, formed [Eckerson Group](#) to help organizations get more value from data and analytics. His goal is to provide organizations with expert guidance during every step of their data journey. Today, Eckerson Group helps organizations in three ways:

- **Our thought leaders** publish practical, compelling content that keeps you abreast of the latest trends, techniques, and tools in the data analytics field.
- **Our consultants** listen carefully, think deeply, and craft tailored solutions that translate your business requirements into compelling strategies and solutions.

- **Our educators** share best practices in consulting workshops or external conferences on 30+ topics that can be tailored to your needs.

Our experts each have more than 25+ years of experience in the field. They specialize in data analytics—from data architecture and data governance to business intelligence and artificial intelligence. Their primary mission is to help you get more value from data and analytics by using their extensive experience.

Our clients say we are hard-working, insightful, and humble. It all stems from our love of data and our desire to help you get more value from analytics—we see ourselves as a family of continuous learners, interpreting the world of data and analytics for our clients and partners.

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