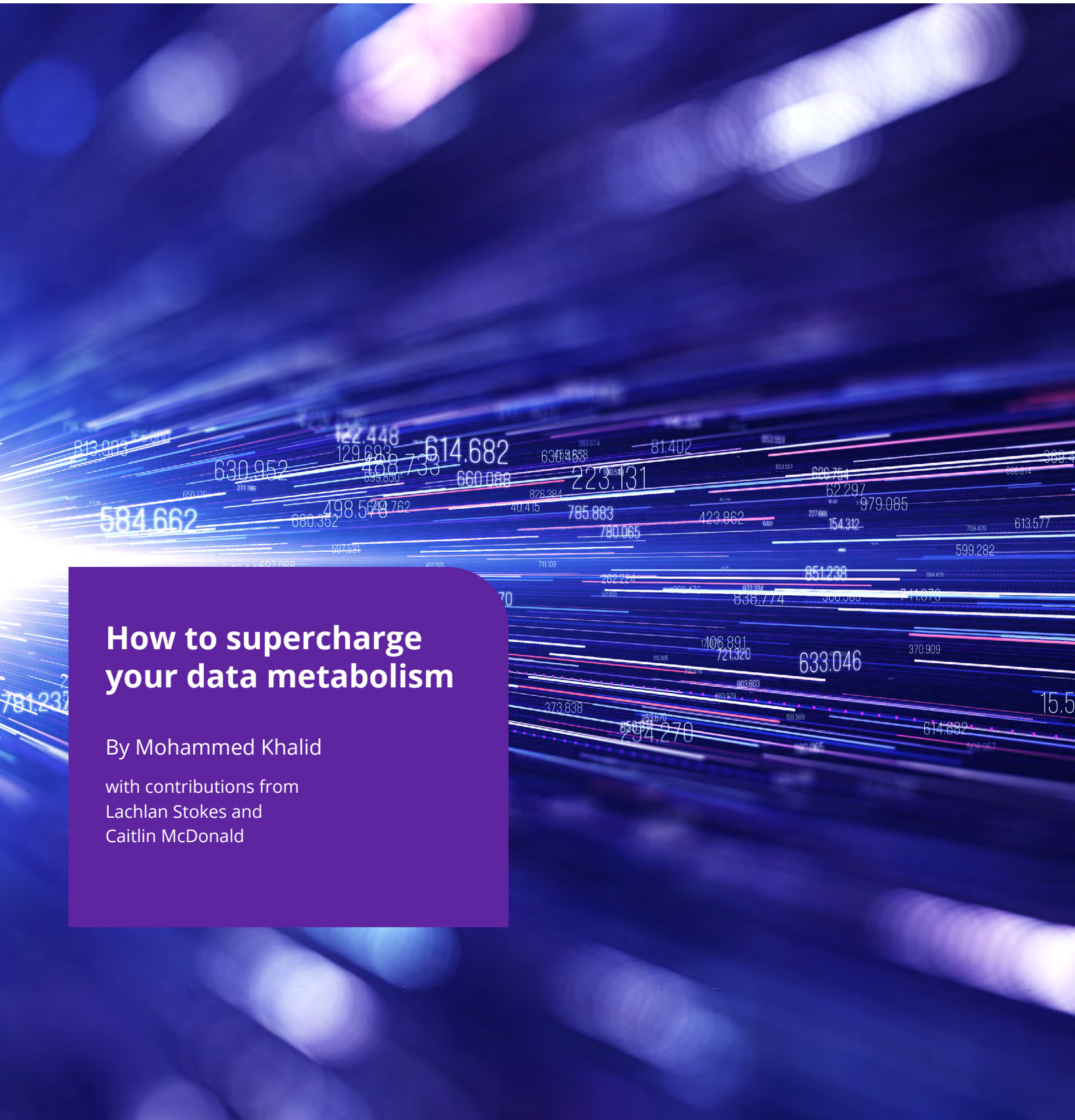
DXC TECHNOLOGY



How to supercharge your data metabolism

By Mohammed Khalid

with contributions from
Lachlan Stokes and
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Table of contents

About the author

Mohammed ("Khal") Khalid

Khal is global advisory director for DXC Leading Edge. He focuses on working with customers to make change happen in an increasingly digital world. As a business leader, Khal is experienced in helping CXOs and their organizations to exploit technology. As a humanist, he has a deep interest in how we learn and develop for success and how we overcome failure. And as an empath, he has strong coaching skills and is prepared to be open and vulnerable with colleagues and customers in order to help them achieve results.

An experienced leader, Khal spent 9 years with Gartner, a leading IT research and advisory company, in a variety of roles throughout Europe. Khal was regional vice president of Gartner Executive Programs, responsible for managing the business and leading a team of highly experienced former CIOs and IT executives in the Benelux region. He was also responsible for service delivery excellence and strategic business development. Before that, Khal was a vice president and trusted advisor to CIOs and executive partners.

A former chief knowledge officer, CIO and now business advisor, Khal is passionate about helping individuals and organizations exceed their objectives and goals.

A study conducted by DXC Leading Edge found that most organizations struggle to make the time-critical decisions necessary to play in today's volatile markets. First, decision making on behalf of the organization must be understood to take place within the three states of Discover, Develop and Defend. Second, data and insights must flow through the organization in a focused and timely manner that supports these three states. In combination, we call this "data metabolism."

Data metabolism consists of the ability to serve up relevant data and insights at the right time and speed to the right people, and, crucially, to optimize decision making. Data management and decision making are inextricably intertwined but are often considered separately, or not at all. They can, however, be realigned to enable optimal performance by enterprises, teams and individuals, as you will read in this paper.

Executive summary

In this paper, DXC Leading Edge:

Surfaces the crisis in decision making:

- Our research reveals organizations are experiencing a crisis in decision making exacerbated by an inability to metabolize data — to serve up the right data and insights[1] at the right time and speed to their constituent groups.
- Organizations with failing data metabolism and overly democratized data, analytics and other information assets are encouraging the people who are invested in protracting or preventing decision making.

The decision-making landscape of global enterprises

[1] Throughout this paper, references to data encompass both data and its accompanying insights.

- A 2021 Economist Impact survey found that six in 10 executive respondents (61%) reported having to cancel a digital project for lack of the right data.[2]
- Business structures and processes are typically — and erroneously — based upon the rule that capital increases in value over time. But information loses value over time, which means existing management and control structures for balancing risks and rewards no longer work correctly.
- A combination of social media, mobility and analytics has led customers, partners and employees to become what we call "appified" and to expect instant gratification at nearly no cost.
- Few organizations can make decisions and act on data at the speed that appified people demand. If your organization cannot roll out thousands of new products every week in a cycle time of less than a week from design to production, you are falling behind.
- Organizational paralysis in decision making is fed by the assumption that more data is better, which perpetuates the problem. Future investments in data, analytics and information management tools not only fail to generate positive returns but also cause further dysfunction.

Explains how to fine-tune data metabolism:

- The taxonomy of Discover, Develop and Defend (the three D's) describes the primary states and outcomes of business activity, enabling focused data usage and a gameplay for optimal decision making.
- The value of data changes differently along the life cycle of each of the three states, and decisions can be optimized by accruing or disposal of data as it values and devalues.
- Many organizations do not recognize the sunk costs associated with Defend duties. In large organizations, it's not unusual to see a substantial proportion of the workforce dedicated to Defend processes.
- Data metabolism can be optimized through careful interventions that balance both decision making and data engineering, as summarized in **Figure 1**. These interventions have been designed based on our learning through the research conducted.

		BUSINESS INFORMATION		
		Gameplay	Gameplay	Gameplay
TYPE OF STATE	Business state	Explosive	Effective	Efficient
	Decision state	Discover	Develop	Defend
	Data state	Variety	Velocity	Volume

Figure 1. Optimal metabolism aligns data focus and activities with business strategy

Introduction

Impaired data metabolism is impeding leaders' decision making

"How can we make better decisions?" is a lament consistently heard in boardrooms across the globe. It was a common refrain heard by DXC Leading Edge when we conducted a study into next-generation operating models in 2020. Paradoxically, it seems the complaint has grown louder as organizations are submerged beneath a tsunami of data: Investments in data lakes, data analytics and data democratization have too often obscured the company's purpose and direction instead of clarifying decision making.

What emerged from our in-depth interviews with 50 senior business leaders across the industry spectrum was their inability to use data in the context of their strategic focus. They all struggle to get the right data to the right people at the right time, to assist decision making.

To plug the deficit, DXC Leading Edge has designed a taxonomy and gameplay to help businesses measure the effectiveness of their data flows and optimize decision making. The metaphors of biological metabolism and ill health reflect the data dysfunction we witnessed, and we use them to illuminate the model that we advocate.

[2] *IT's changing mandate in an age of disruption*, The Economist Intelligence Unit, 2021: https://impact.economist.com/perspectives/sites/default/files/itschangingmandate_final.pdf

When data is used — or metabolized — effectively, it generates actionable insights and the means to accurately identify, articulate and balance opportunity and risk. Balancing the trade-off between risk and reward and acting on knowledge in a way that optimally serves business goals is, after all, a core skill of a successful organization. It's a prized leadership skill because negotiating the risk–reward chasm inevitably entails reconciling a degree of conflict in deciding where a company needs to play.

A common conundrum illustrates the point: Companies increasingly deploy data analytics to better understand customer behavior and to create innovative prototypes, but deciding which prototypes to fund and take into production is a much harder question to answer. By using relevant and timely data to obtain an accurate picture of how each prototype would play in a market scenario, organizations can optimize their risk–reward position with respect to their business strategy.

Unfortunately, data isn't being streamlined throughout organizations to enable the experimentation and bold action demanded by risk–reward decision making. During our research, we consistently heard that organizations were experiencing a wide range of operational problems and that the solution lay in solving their "data issues." Invariably, such solutions involved getting access to more, faster or different data than presently available and used. The common belief seemed to be that once these issues of data access had been resolved, organizations would enter a new golden age of operational excellence.

Data metabolism: The perils of a voracious, undiscriminating appetite for data

Diet and its impact on health and the body's metabolism has created one of the biggest health crises in the modern, developed world — a fact reinforced during the COVID-19 pandemic. The perils of overconsumption and its debilitating effect on metabolism are an apt analogy for exponential growth of data consumption in the corporate world. Through our research, we heard constantly of the need for "more" and "better" data from people who didn't connect this appetite to their stymied decision making.

In 2001, Doug Laney coined the term "big data" to describe the phenomenon of growth in business information, and he defined the values of Volume, Velocity and Variety that drive data growth. When these are in balance, data can be converted into actionable insights that inform decision making, just as the healthy human body metabolizes food into energy. Sadly, for most organizations, data consumption is out of kilter with organizational needs.

Different data types relating to organizational activities such as innovation, compliance or strategy need to be served up to the relevant people in appropriate quantity and timeliness. Only in this way can data fuel effective decision making.

During our research, we noted a direct parallel of the human body's glucose cycle in how organizations metabolize data. We call it the data cycle. Organizations source data from many places, including business systems, social media, the internet of things, GPS coordinates and many more. These data sources are ingested into databases, data warehouses, data lakes and so on, where the data is stored for use.

This data is then metabolized by the organization by using it in business processes typically embedded in corporate information systems, such as enterprise resource planning (ERP), customer relationship management (CRM) or supply chain management (SCM) systems. As with sugar consumed by humans, data is used either to power the organization's physical or knowledge-related activities or is stored for some future use.

To complete the analogy, organizations have (or at least, should have) some means of effectively eliminating data that is no longer useful, to prevent toxicity.

Ineffective data metabolism leads to suboptimal decisions

But this belief was contradicted by a universally shared sentiment among our leadership cohort of interviewees: Despite substantial investments of time, toil and treasure, their "data issues" were growing worse, not better. Our findings led us to a new and revealing observation: Organizations are suffering a crisis not of data but of data metabolism (see box on previous page) and this in turn has culminated in a crisis of decision making.

Organizations are deepening their data lakes only to find that they are not more but less able to convert — or metabolize — this data into business outcomes. For most organizations born before the digital era, more data and more analytics are likely to overwhelm their metabolic processing rather than optimize their data value and decisions. (An exception is Netflix, the DVD mail-order business turned streaming giant.) The remedy we recommend is to fine-tune the organization's data metabolism; and here, we take inspiration from the basketball legend Michael Jordan (see "Tuning consumption to fuel metabolism and gameplay" on next page). His pioneering coach Tim Grover went against received wisdom and intentionally fed meat to the star before basketball games in order to fuel his explosive playing style.

Serving up the right data at the right time and speed similarly optimizes different kinds of organizational plays, whether prospecting leads, nailing down compliance or determining strategy. In practice, the quickening pace of economic life over the past 20 years has meant organizations have simply sped up their ingestion of huge amounts of data, without an accompanying adaptation of business processes and rules. Investing effort to understand and modify the way your organization ingests data that is served in huge varieties and volume, and at velocity, will significantly improve your decision making.

Misunderstanding data value creates metabolic imbalance

We found that three fundamental flaws perpetuate an organization's data imbalance. First is the misunderstanding of data's value. While capital wealth is still important, it is being substantially eclipsed by *information wealth*, and the two accrue value differently over time. With capital, we are rewarded for mere possession of the asset, whereas in most instances information loses value over time, and some data becomes valueless the moment it is acted upon. Thus, all our management and control structures for balancing risks and rewards no longer work correctly.

The second mistake is that businesses transact their data based on structures founded upon the rule that capital increases in value over time. Most organizations more than 20 years old operate with business processes and business rules defined in the late 1990s to early 2000s. With the notable exceptions of Netflix, Amazon, Microsoft and Google, few have taken any steps in two decades to change their bureaucracies, processes and rules, which means they are trying to apply 20-year-old structures to a world with dramatically higher data volume, variety and velocity.

Third is the disconnect between the speed at which organizations move and act upon data and the faster transactions that data-savvy customers expect. A melting pot of social media, mobility and analytics has caused our customers, partners, employees and citizens to all become appified: The smartphone and apps have habituated society to expect instant gratification at nearly no cost. While these expectations may be undeliverable, they nonetheless permeate our society and will likely intensify with time.

The trio of flaws culminate in a common, toxic situation: Organizations have ready access to nearly limitless amounts of data, yet few are able to act upon that data and use it to make decisions at the speed that appified people demand. Companies with effective data metabolism currently roll out thousands of new products every week, and their cycle time from design to production is less than a week. If your organization cannot do the same, you are falling behind.

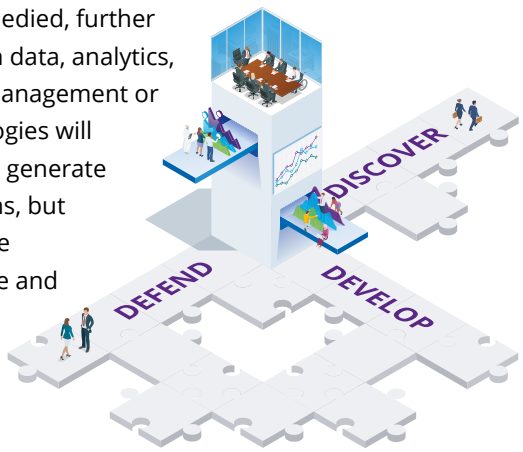
A taxonomy for decision making

To help organizations use data optimally to navigate the conflict inherent in reaching decisions, DXC Leading Edge has created a taxonomy and a gameplay for decision making. Our view is that data primarily supports three states within organizations (see **Figure 2**):

- **Discover.** This state entails seeking out new properties or engaging new methods to help us evolve and advance.
- **Develop.** Swift action is needed to chart a course between the two opposing yet necessary activities of Discover and Defend, and to increase the group's health and wealth.
- **Defend.** Here, the onus is on protecting resources and maintaining the group's health and viability.

Figure 2. The three primary uses of data

While these states and their actors occupy distinctly different purposes, the data that is served up to them for their piece of the play is generally monolithic. If an actor had more of the kind of information that feeds their function and decision making, served at the correct time and speed, they would be able to perform better. Our research reveals that organizations are already experiencing deficiencies across the three D's of Discover, Develop and Defend. Unless the malaise is remedied, further investments in data, analytics, information management or other technologies will not only fail to generate positive returns, but will likely cause further disease and dysfunction.



Tuning consumption to fuel metabolism and gameplay

Back in the 1980s and 1990s, the nutrition prescribed for athletes was carbs, carbs and more carbs. Everyone was eating rice and pasta for fuel. But as sporting super coach Tim Grover recalls, the diet was insufficient for the explosive playing style of basketball legend Michael Jordan.

"Aside from feeling bloated, (MJ) was playing so hard that it wasn't enough for him. We had to devise a new plan for Michael, based on his body chemistry and schedule, his playing minutes, and the massive amount of energy he expended on the court. A pre-match steak slowed down his digestion of everything else he was eating and kept his blood sugar consistent."

From *Relentless: From Good to Great to Unstoppable* by Tim Grover

This report details the taxonomy, models and gameplays for using data effectively in decision making and explores the crucial role of a healthy data metabolism. It calls for a radical rethink of the role data plays in the modern, post-pandemic world and shows how organizations can retune their metabolisms to remain contenders.

Cultivating a mindful approach to data and decision making

Over the course of this research, DXC Leading Edge constructed several models to represent the insights we gained and to help explain the various factors that both boost and undermine an optimally functioning data metabolism in organizations.

As described in the introduction, organizations are ingesting modern-day levels of data, but are attempting to metabolize it with business constructs more than 20 years old. Few have reengineered their business processes, systems, policies or procedures since the first wave of ERP and e-commerce ended, around 1999 – 2000. Worse, organizations are

constantly increasing the amount of data they consume to keep up with current market conditions and appified customer demand. The knock-on effect for businesses is that they aren't able to convert this data into value-generating outcomes because of their antiquated business methods.

A critical first step out of the data metabolism crisis is identifying the desired business outcomes and thus the purpose of the data. We have developed a taxonomy and models to describe decision making that will help organizations cultivate an understanding of how to use data in order to generate outcomes, both now and in the future.

The three primary uses of data

In the data cycle model, the Discover, Develop and Defend states describe the three primary uses of data or outcomes that data needs to support, and the states that staff occupy when using the data to achieve those outcomes. This taxonomy also maps onto the three stages of technology strategy — disruption, modernization and transformation — signaling the effective use of data and people in these interrelated endeavors (see Figure 2). The taxonomy helps us understand the function of data, its allocation to people and processes, and how to align these for optimal data metabolism.

In the Discover state, business functions, processes and people predominantly use data to explore and research leads, products and new services; data is used heavily in research and development and sales activities. Defend is the natural domain of compliance, legal and regulatory teams as they seek to mitigate risk and protect a company's assets, reputation and position. Most critically, the Develop state is chiefly — but not exclusively — used by leaders to balance risk and reward in strategic decisions about operations that generate action, results and direction, which in turn grow and strengthen the business.

Organizations that do not recognize and respect the distinctions between these three decision states are likely to get poor results in one or more of them. This is inevitable, as a monolithic approach to data management will necessarily bias one of the three data processes over the others. This is at the heart of getting data metabolism right: If one or more of these processes is not metabolizing data effectively, and this is causing an imbalance, the organization's essential functioning will fail.

The problem: An abundance of data

- Most of our business structures are based upon the rule that capital increases in value over time. With capital, we are rewarded for mere possession of the asset. Anyone familiar with investment hurdle rates set by their chief financial officer (CFO) can attest to these structures being in place. Unfortunately, in most instances, information loses value over time, and some information becomes valueless the moment it is acted upon. Thus, our existing management and control structures for balancing risks and rewards no longer work correctly.
- A melting pot of social media, mobility and analytics has led our customers, partners, employees and citizens to become appified. The smartphone and apps have habituated society to expect instant gratification at nearly no cost. These expectations that increase our consumption of data permeate our society and will only intensify with time.

The result: Observations of data metabolism malfunction

- Most organizations more than 20 years old still operate with business processes and business rules defined in the late 1990s to early 2000s. With the notable exceptions of Amazon, Microsoft and Google, few have taken any steps in two decades to change their bureaucracies, processes and rules, which means they are trying to apply 20-year-old structures to a world with dramatically higher data volume, variety and velocity.
- All organizations have ready access to nearly limitless amounts of data. However, few can act upon that data by making decisions with it at the speed that appified people demand. We have examples of companies who currently roll out thousands of new products every week, and their cycle time from design to production is less than a week. If your organization cannot do the same, you are falling behind.

As **Figure 3** illustrates:

- **Discover** aligns with ***explosive*** action that aims to *disrupt the industry*. It is the route to innovation, disruption and elimination or avoidance of constraints. It is the world of SpaceX, Tesla and Uber.
- **Develop** aligns with ***effective*** strategies, or with *transform the industry*. Here, rules or constraints may be bent or even broken if the value delivered warrants it. This requires someone to make such decisions, leading to organizational transformation. Active leadership is required to determine the trade-offs between risk and reward, and then make the necessary judgment call.
- **Defend** is an ***efficiency*** play and is highly aligned to *modernization of the IT foundation*. Defend recognizes and acknowledges the constraints that the organization operates under and seeks to get the outcomes that those constraints define, as efficiently as possible.

The leadership/people engagement model

In the first model we mapped the three D's to the conflicting goals of risk and reward along the hierarchy that exists in most organizations:

- Discover is predominantly aligned to rewards. Organizations do R&D, market research, operational analytics and so on to create new products and services, and new opportunities for growth.
- Develop resides in both risk and reward and represents an organization's efforts to balance risk and reward in order to produce value.
- Defend is predominantly aligned to risk. Organizations protect themselves from legal or regulatory issues, cut costs, track how money is spent and so on, to minimize risks to the business.

The leadership/people engagement model represents our finding that the inputs required of the three D's do not exist evenly throughout an organization, and this must be both respected and leveraged for an organization to remain healthy. Not all people at all levels of an organization participate equally in Discover, Develop and Defend.

Know your goal: Efficiency, effectiveness or explosiveness

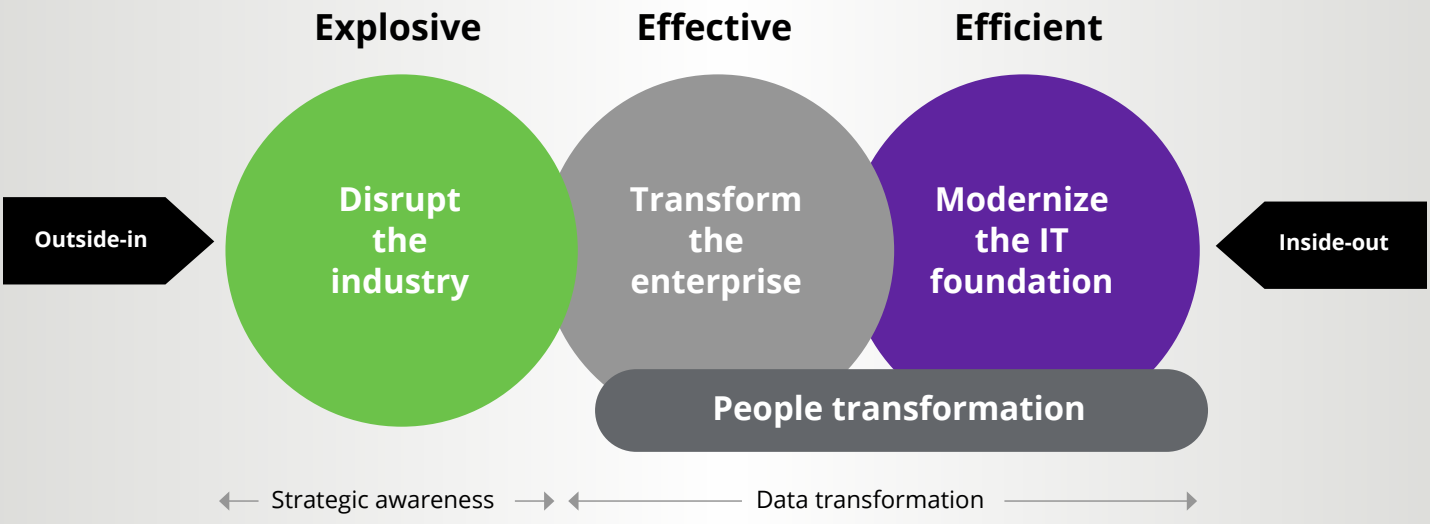


Figure 3. The three-bubbles model of technology strategy

The optimal organization

The leadership focus shown in **Figure 4** illustrates how constituent groups participate in a healthy organization that has achieved proper balance across the three D's.

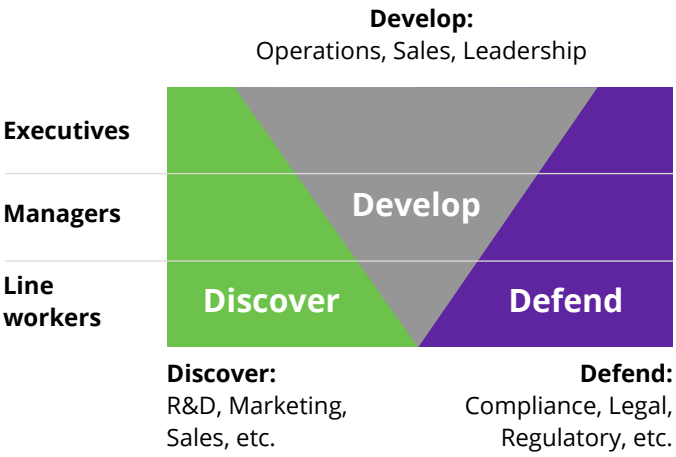


Figure 4. Leadership focus (optimal)

In Figure 4, green represents activities or responsibilities aligned with **Discover**, purple with **Defend** and gray with **Develop**.

Develop forms a healthy arrow shape, with the broadest section of activity at the top, showing how balancing risk against reward is the almost exclusive concern of the leadership and executives. The arrow tapers down through the graph to the bottom tip, separating the risk and reward domains with which colleagues respectively in Defend and Discover are primarily occupied.

Note that Develop is most finely balanced between risk and reward. Some decisions will be dominated by seeking revenues, profits and other rewards, and others by the need to minimize risks or lower costs. Developers must respect both factors and maintain a balance between them. And it is executives and managers — those with authority — who are in the position to make such decisions in Develop.

A use case to illustrate how this spread of activity works in an organization with an optimal data metabolism is a pharma giant that employs an army of highly qualified scientists and SMEs, both in house and as contractors, who collaborate to research the next generation of drugs. These specialists will work and make decisions exclusively in the realm of Discover. In some instances, an R&D arm may be cordoned off or even outsourced entirely — in which case these people should have minimal or no participation in Develop, given their lack of stake in the outcome.

Specialists stick to their domain

People working in the counterdomain of Defend also play a critical role in the highly regulated pharma sector. Compliance and legal teams ensure due diligence is practiced, and the company does not get embroiled in lawsuits. The finance team must ensure the company is viable through the lengthy life cycles of bringing products to market — and maintaining cash reserves available to fund future research.

Like the scientists in Discover, the numerous patent attorneys, litigation experts and financiers employed on Defend duties also tend to be dedicated to their specific arena. Lower down in the hierarchy, the involvement of advisors or SMEs in Develop is non-existent or minimal. Higher up in the organization, managers in the Defend process may have some decision-making authority, which confers participation in Develop and walking the line between risk and reward.

Executives focus on Develop

Finally, executives are entrusted with the most authority and their job is to focus on Develop. They must keep abreast of relevant scientific research (Discover) and remain cognizant of pertinent financial or legal risks. But if they put too much time, energy or focus into either of these, then they will be wasting the authority that was given to them. Consequently, Develop — the means by which decisions are made about which products to finance, which to maintain and which to sunset — would be underserved as a result.

The suboptimal organization

In contrast, **Figure 5** models a suboptimal data metabolism. Instead of Develop occupying a top-down, arrow-shaped formation of activity, the shape is inverted, with too much energy and time expended in separate and deep-down Discover and Defend states.

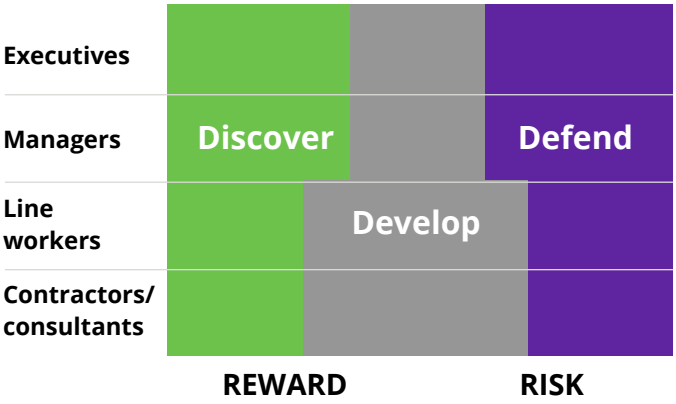


Figure 5. Leadership focus (suboptimal)

Authority and decision making misaligned

This hypothetical pharma organization is completely unbalanced, with a skewed data metabolism. Decisions are being made by outsiders who should not have that authority. Those with the requisite authority (executives and managers) are not using it to make decisions but are overly engaged with the minutiae of Discover and Defend. They are perhaps over-invested in an acquisition to obtain new drug patents or new product development, or conversely (in the Defend corner) with an upcoming regulatory compliance matter.

In this hypothetical malfunctioning pharma company, there is a failure of delegation, typically caused by people mismatched to their role. Perhaps a head of R&D (Discover) or a CFO (Defend-oriented) has been promoted to CEO and is struggling to shift their focus. The example also displays an imbalanced data metabolism: People lower down in the organization are making decisions for which they should not have the authority because they are not motivated by the risk–reward equation — and yet if they are not making these decisions, then no decisions will be made.

Over-democratization of access

Another example of an organization that needs to rethink its data metabolism is one where Discover, Develop and Defend are treated equally by all. This is clearly dysfunctional because if someone is focused on everything, they are focused on nothing. While it may seem egalitarian, democratized and fairer for people lower in the hierarchy to have more of a role in Develop — are they prepared for such authority?

Using the model to quantify and score organizational metabolism

Fortunately, the leadership/people engagement model proportions in your organization can be quantified and hence scored and understood. The various populations can be surveyed and asked to document where they invest their time, energy and focus in their day-to-day activities. This would give the organization a sense of how effective its metabolism of data is; it can draw its own unique leadership focus, reflecting its current state.

Further, organizations can quantify their leadership focus by reviewing their productivity and communication tools, such as Outlook. An individual's expenditure of time, energy and focus is often quantified in their calendar and their in- and out-boxes. We predict that these sources of data (together with surveys and data analysis) may not always be consistent, which would further indicate the degree to which the organization needs to optimize its data metabolism.

Streamlining decision making through gameplay

The importance of the three states of Discover, Develop and Defend becomes clear when you deconstruct the process of decision making. It is only when you have identified the relevant actors in the decision and their role in the context of the three states that it is possible to see how organizational data supports these actors — or not. Increasingly, the actors will be machines working alongside humans. In our research, as we continued to digest our understanding of the three D's and their reverberation around data, actors and (ultimately) decisions, it became clear that enterprises wishing to optimize the states needed a gameplay.

Each state relies upon the same three key elements of decision making: authority, accountability and ability (the three A's). Every decision made in pursuit of the three D's purposes uses these constituent parts, but to differing degrees (**Figure 6**).

Figure 6. The three elements of decision making

The elements of data metabolism: Authority, ability and accountability

- **Authority.** This matters in decision making, as it should correspond to the level of risk, and hopefully, reward, associated with the given decision. If the potential risks are high (in either probability or magnitude of loss), more authority should be required to make that decision. Authority is one of the most valuable, rare and wasted resources at an organization's disposal. Indeed, the wasting of authority is at the heart of ensuring an optimally functioning data metabolism. Authority is the realm of decisiveness, confidence and commitment. It is about assessing which data is relevant to the decision at hand and focusing only on that data, to the exclusion of everything else.
- **Ability.** This speaks to the knowledge required to properly assess the data being used. It is about asking the right questions and being able to accurately interpret the results. Discovery is the realm of knowledge, experience, analytic ability and the scientific process. When organizations speak of "democratizing data" or "analytics for everyone," they are embracing an egalitarian approach to the use of data that fails to recognize that not everyone has the necessary ability to properly put that data to use. Democratizing data is yet another path toward an imbalanced data metabolism, as more and more people want to participate in a process for which they may not have the necessary ability.
- **Accountability.** This contributes to decision making as the necessary counterbalance to authority. Since at least as far back as Plato, we have known that authority without accountability leads to oppression or corruption, hence the extensive focus that organizations have on governance, compliance and control. It is how an organization can ensure that the right things are done by those with authority and that bad decisions carry consequences. Having ample data is more likely to generate an accurate answer. However, this also means that there is more data to digest. Once again, we may be led away from efficient data metabolism when we hunger for more accuracy from more data than we can reasonably use.

Our research in this phase focused on the apparent dysfunction in decision making that nearly all our customers noted within their own organizations. Develop is predominantly driven by authority rather than either ability or accountability. We observed that if organizations found it a challenge to Develop effectively, there was something out of balance between their use of authority and the countervailing forces of Discover and Defend.

Playing the market successfully is the route to success for any enterprise — and for it, they need a gameplay.

The decision-making game

To explore the nature of optimal decision making in organizations, our research focused upon the necessary tension between Develop and Defend, and what constitutes a healthy decision-making metabolism. We devised the decision-making game model shown in **Figure 7** to capture the social dynamics, or games, that are endemic in organizational decision making.

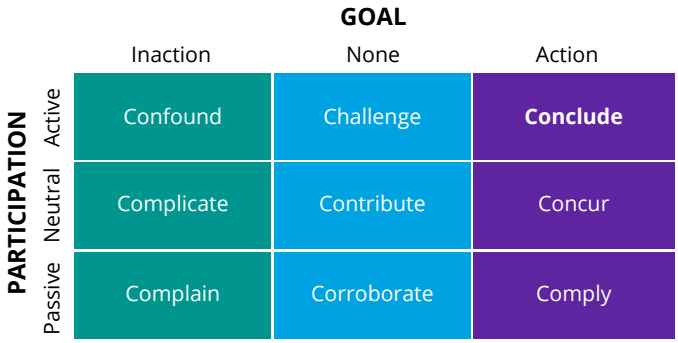


Figure 7. The decision-making game

In the decision-making game, the social dynamics of decision making have two primary dimensions: the nature of a person's *participation* and their *goal* in participating in the decision at hand. A person *actively* participating in a decision has a meaningful stake in the game and has the requisite authority, accountability and ability to drive the decision process to a given state. A *neutral* participant is generally lacking in at least one of the three A's, and generally takes a speak-when-spoken-to approach to the process. *Passive* participants are likely lacking in at least two of the three A's, and perhaps all three. They have little motivation to enter the fray of the process and typically avoid direct involvement.

On the goal dimension, some process participants are *action*-oriented; they want a decision to be made. In the middle (*none*) are people who do not have a goal pertaining to the decision to be made, but take part nonetheless. Finally, some participants want *inaction* regarding the decision — they prefer a decision not to be made. While this may appear counterintuitive, it's a natural outcome of rewarding the possession of capital-based wealth, and how this influences the Defend process in most organizations.

These three categories in two dimensions lead to the three-by-three matrix of potential roles that an actor might play within a given decision-making process, with nine resulting roles, as shown in Figure 7:

- **Confounders** are those with all three A's whose goal is to prevent the decision from being made, in the belief that the risks outweigh the rewards. This is a controversial description for this role for good reason, as we will discuss below.
- **Complicators** can be thought of as SMEs who point out what is unknown, inadequate or unsure in the given decision process, thereby emphasizing inaction. These are people who often say, "If we only had more or better data, or another report, then we could make a better decision." They complicate the issue at hand — sometimes appropriately so, but nonetheless they are contributing to inaction.
- **Complainers** are those who desire decisions not to be made so that they can complain about the failures of the decision-making process itself.
- **Challengers** are people who generally have a sufficient command of the three A's to make or stop a decision, but don't have a vested interest in the decision at hand. They want to actively participate in the discussion, but don't really care where it leads. These are often people who are seeking their five minutes of fame in a meeting and challenge either the decision, the rationale or the process.
- **Contributors** do not have a vested interest in the decision at hand and generally speak only when spoken to. This is where SMEs often find themselves. They are typically from the Discover world and have a great deal of ability but little authority.
- **Corroborators** are not engaged in the decision nor interested in its result. They are effectively witnesses to the process — there to corroborate what took place, should anyone care to know after the fact. Typically, these are people from Defend with an emphasis on accountability.
- **Concluders** are active participants whose goal is action. They are trying to conclude, whether yes or no, up or down. Concluders require adequate amounts of all three of the A's to make such a decision, and if they have the requisite authority then deciding is their role.

- **Concurrers** are people who desire that a decision be made but are lacking in one or more of the three A's (authority, in particular). Once a decision has been made, people in this role agree with that decision and effectively co-sign it.
- **Compliers** cannot make the decision, but they desire that a decision be made so that they have direction and know what they need to do. Their interest is in complying with whatever decision is made.

Healthy decision-making gameplay

In healthy decision-making processes where data metabolism is optimized, there is a necessary tension between concluders and confounders. The former seeks rewards, the latter avoids risk. The former comes from Develop, the latter from Defend. As long as these two are balanced, an organization will benefit from the rewards of effective decision making.

Decision making becomes broken when one inappropriately overpowers the other. When this occurs, an organization either takes irrational risks in pursuit of rewards or is frozen in fear of making the wrong decision. In either case the most valuable resource an organization has at its disposal (authority) is wasted.

We found organizations with a failing data metabolism and an over-democratization of data, analytics and other information assets, which enable people invested in protracting or preventing decisions. In these organizations, data assets are not enhancing the necessary roles in the ways that they need.

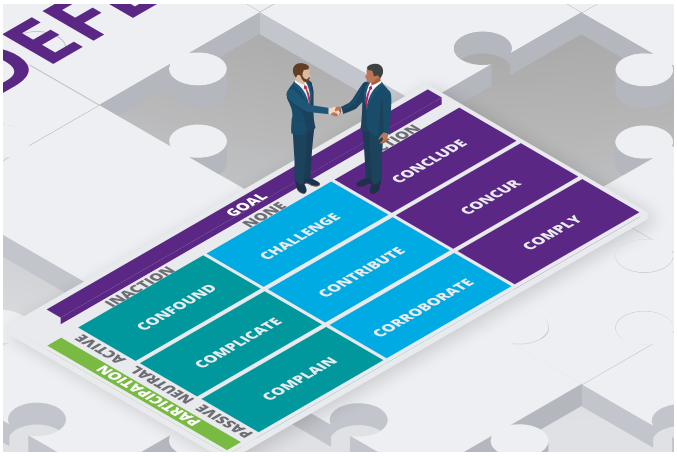


Figure 8 maps the three D's onto the decision-making gameplays. In each instance, there is a right way and a wrong way to data-enable a given role so that they can be more effective in the decision-making process. Ideally, in a data-driven world, better decisions will be generated faster.

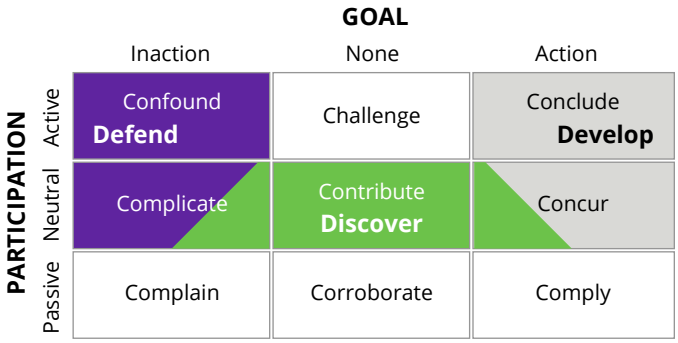


Figure 8. The three D's mapped onto the decision-making gameplays

The risk is that suboptimal decisions will come slower, and the organization's data metabolism will grow worse.

Specifically:

- Concluders do not need more data or a wider variety of data, but faster data and the ability to determine which data is most relevant to making the decision at hand.
- Confounders do not need data faster, or of greater variety; to Defend effectively, they need the most accurate information about the risk of deciding, to make their concerns most obvious and relevant.
- Complicators, contributors and concurrers are predominantly in the Discover process, and they therefore need access to a variety of data in support of their goal in the process. Give complicators more data, and they will certainly use it to delay the decision. Give concurrers more data, and they will co-sign the decision with greater vigor. Give contributors more data, and they will be able to answer questions asked of them with greater confidence.

The aim of the decision-making game is to drive forward a decision. And the essence of playing an effective decision-making game is to simplify the number of people involved in a decision and reaffirm what role they need to play. With their purpose clarified and redefined, it's then a more straightforward task to furnish them with the relevant data and insights necessary to support them in that activity.

Making timely decisions in the data value life cycle

The value of data and its accompanying insights fluctuates along the life cycle of Discovery, Development and Defense. These decision states — and the profit or loss they yield — can be optimized by either serving up and accruing data, or ditching it, at the right time. The ability to do this hinges on understanding the data metabolic rate: how data flows over time. It's an important consideration because, as noted at the outset, most organizations' processes and data are moored in the life cycle of capital wealth, which accrues value over time; but in the information economy, data devalues over time.

As we advanced our research, it became apparent that while the three D's are interrelated, they operate at entirely different rates, with entirely different value propositions and entirely different life cycles. They may all utilize the same data assets, but they consume them and create or destroy value from them in completely different ways.

The data metabolic rate

Our analysis resulted in our *data value life cycle* model. This defines the life cycle of each of the three D's and their value generation for the organization over time (**Figures 9**, **10** and **11**).

Discover and Defend data devalues over time

Both Defend and Discover erode in value over time because of the accumulation of maintenance and operational costs. Many organizations do not recognize the ongoing costs associated with having data at hand, whether active or archived. The vast majority of records that organizations maintain in their databases are of no inherent value. They may be useful for the accuracy demands of Defend, but they are unlikely to contribute any value in Discover, and they are superfluous to Develop.

For example, a digital thermostat such as Google Nest records the temperature every 30 seconds. Over a year, that Nest could have created 1,051,200 records that all say "22°C." Is any of this information really useful? Perhaps, but likely not. However, every time a query is made against this data set, these useless records add to the analytic load on the system, reducing its performance and increasing costs. These costs are largely unrecognized by organizations, or they are seen but ignored. The costs may be small, but they accumulate rapidly.

The value lines in the data value life cycle capture the accumulation of costs associated with Discover and Defend and flag the juncture at which the economic value of the data becomes increasingly negative — the data end of economic life (DEEL). Typically, it's where the regulatory requirement for retaining a record ends. It is a controversial stance to take, but there are ever-accumulating costs — both monetary and risk — of retaining and maintaining data past this point. Data storage is not free, nor are the people maintaining, analyzing and using it. These ongoing costs must re-enter our value equation so that we can properly assess the economic value of data as it feeds the three D's.

Life cycle of the Discover process

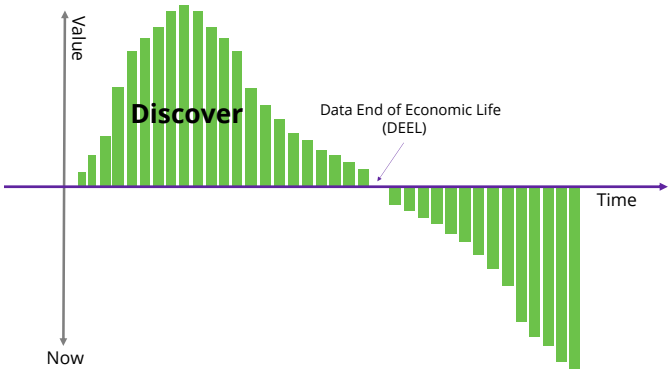


Figure 9. The Discover life cycle

Discover begins after a decision is made, because we can discover the results of a decision only after the decision is made. Discover can continue for as long as an organization chooses to pursue it, although not without cost and risk. Discover feeds off the breadth of information that is available, and the access that may be provided to it.

The Discover life cycle begins with positive, but relatively low, value. This is because the value of some insights may take a while to be realized. They may initially be viewed as an anomaly or accident and might require further vetting before they can be believed. An example is the scientific method of peer review, testing and experimentation.

If a discovery stands the test of time, its value increases. However, costs of data acquisition, retention, analysis and evaluation continue to grow over time. As a result, the value curve peaks, then begins to decay as the costs and risks continue to accumulate.

Eventually, the economic value of the discovery becomes negative when the DEEL point is reached.

Life cycle of the Develop process

Figure 10 shows the life cycle of the Develop process. It starts some time before a decision is made and continues for only a brief time. Information that effectively tells us the correct course of action in a timely manner is the raw material of Develop. Hence Develop feeds off speed and the ability to assess which data is most relevant to the decision.

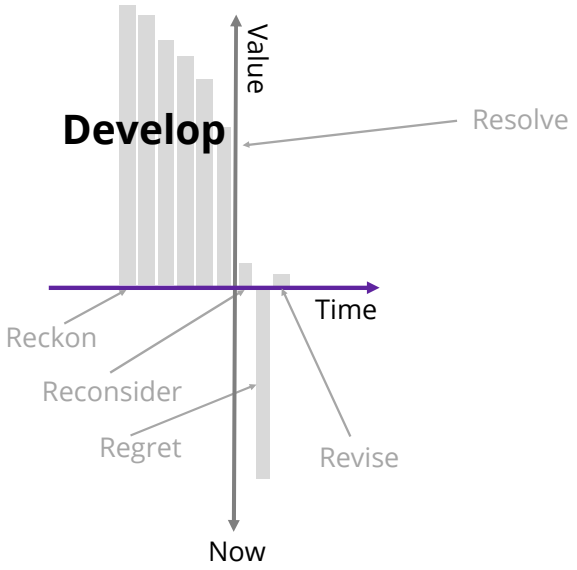


Figure 10. The Develop life cycle and R-loop

Note that all organizations have access to a wide range of data that may support better decision making, but they may not know which of it is the most useful. A 2021 Economist Impact survey found that six in 10 executive respondents (61%) reported having to cancel a digital project for lack of the right data.[3] It follows that access is critical to Develop. Having good Develop data in advance of a decision is very valuable, as represented by the Develop curve.

[3] *IT's changing mandate in an age of disruption*, The Economist Intelligence Unit, 2021: https://impact.economist.com/perspectives/sites/default/files/itschangingmandate_final.pdf

The R-loop describes the iterations of the Develop decision life cycle

- The period immediately before a decision is "Reckon."
- The foresight value of Develop data decays as the time of deciding (now) draws near and it is necessary to "Resolve" on the way forward.
- Immediately after, there is a relatively short period of time when the decision can be rescinded without significant loss. This is the "Reconsider" point. Reconsider still has a positive value, but much less than that of the decision. This is an acknowledgment that a greater loss was avoided, but the expected gain was lost.
- Bad data decisions lead to "Regret" and negative value.
- Finally, if the developer uses what they learned from the bad decision, and corrects for it in the future, they "Revise" their decision making, and regain some positive value from the prior loss. Hence the curve once again rises along the value line.

Life cycle of the Defend process

As **Figure 11** shows, Defend (like Develop) starts some time before a decision is made, and it continues until such time as the Defend data no longer needs to be maintained. This retention period is typically defined by laws or regulations but may also be determined by internal factors. Defend feeds off the volume of information that is available, and the accuracy with which this data is analyzed.

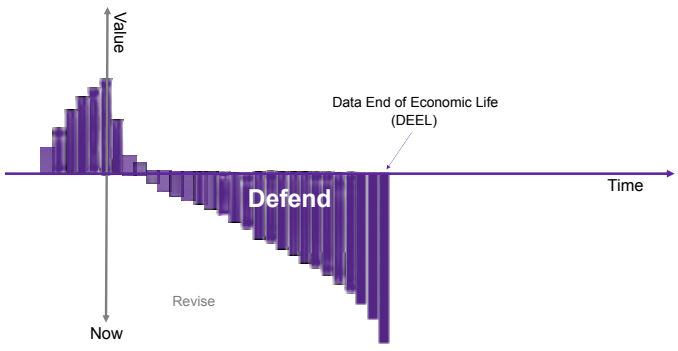


Figure 11. The Defend life cycle

While Develop focuses on achieving value, Defend focuses on retaining value. Throughout the decision-making process there is a constant tension between Develop and Defend, which is reflected in the Defend curve. Prior to *now*, the point when a decision is made, Defend is there to challenge Develop to do the right thing.

As with Develop, Defend data is readily available to the organization as it prepares to make a decision. It may include regulations or laws that govern the decision, internal policies, procedures, habits, or norms that determine what acceptable decisions or risks may be taken. As an organization approaches the decision point there is increasing tension between Defend and Develop. This is reflected in the increasing positive value of Defend data as the decision is approached.

For the reasons outlined previously, our research found that most organizations are finding their Develop loop to be under ever-increasing pressure to speed up. By analyzing each of these processes first individually, and then collectively, an organization can better understand its data metabolism and assess the degree to which one or more of these processes is not functioning properly.

The real value of the data value life cycle model is in helping to recognize that an organization's data and analytic needs are not monolithic; all three of the D's must be served according to their own needs. If you build a single enormous data lake, analyzed by a single analytic tool generating homogenous analytic results, it will almost certainly mean that at least one of these processes is underserved — undermining a functioning data metabolism.

The sunk costs of Defend decisions

Many organizations do not recognize the constantly accruing costs of maintaining Defend data and Defend actors. Alongside compliance, legal, security and audit functions, other key business departments including finance, procurement, human resources and logistics may become over-fixated on the Defend aspects of their responsibilities.

Further, while Defend activities are critically important to a healthy organization, when Defend is activated it is almost always because something bad has happened. Defend data might mitigate the damage done, but the net result for the organization is still negative.

We struggled with some of the ethical implications of this perspective of Defend, which might be seen as undervaluing the mitigation of damage to stakeholders. In the hypothetical example of a product liability lawsuit, the piece of Defend data that helps an organization win its case would seem to have positive value — as indeed it does. However, this is likely to be insufficient to overcome the costs (reputational as well as capital) of being in the lawsuit to begin with.

Because of the ongoing costs of operating Defend and the potential for smoking gun events to appear in the future, the value of Defend data continues to grow increasingly negative until such time as it is no longer needed. At this point this data has reached the end of its usefulness in Defend, and effectively converts into Discover data, should anyone have any interest in it. The value clock resets to zero for that data, if it is retained.

The Wardley Pioneer, Settler, Town Planner model

As our research project progressed, it became clear that findings around data and decision making strongly correlated with our colleague Simon Wardley's Pioneer, Settler, Town Planner (PST) organizational operating model, shown in **Figure 12**.

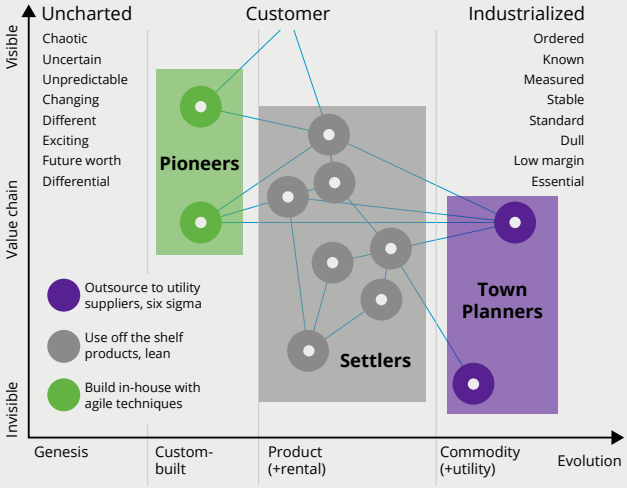


Figure 12. The Wardley PST model: Right people, right place

Pioneers are the people inventing new products and services, leveraging agile principles in finding them and striving to generate new revenue streams. Settlers are focused on productizing innovation, finding value, driving profitability and focusing on customers. Town Planners are focused on commoditization, efficiency, cost containment and defense of existing revenue streams. These cohorts align with Discover, Develop and Defend, and provide a complementary roadmap for implementing the findings of this research.

Conclusion

Symptoms, diagnosis and treatment

In conducting our research, it was heartening to hear from multiple customers that this material provides answers to questions they had struggled with for a very long time. The challenges facing organizations over the past 20 years in effective use of data have grown at an exponential pace. While most of the organizations we analyzed had made substantial investments in data management and analytics over the last decade, few could point to meaningful gains in productivity or business value.

Research and business literature is rife with examples of such missed expectations. It is our hope that by articulating the true problem underlying these missed expectations, our customers will be empowered to make better decisions regarding the metabolization of data in their organizations. We hope that knowledge of a thriving data metabolism will assist you in becoming a healthier, better-adjusted organization in the future.

The analogy of illness and treatment continues in our listing of symptoms, diagnosis and custom treatments outlined on the next page.

Symptoms of sluggish data metabolism

Throughout this paper, our recommended approach to dealing with poor data metabolism has used the analogy of treating a disease. When a person feels ill, they have symptoms, which a doctor then uses, together with test results, to make a diagnosis and prescribe a course of treatment that addresses the patient's specific needs.

We have identified a wide range of symptoms that organizations with unhealthy data metabolism suffer. Here are some common examples:

- The organization has fragmented the role of chief information officer into a range of sub-roles (chief data officer, chief digital officer, chief analytics officer, and so on) that focus on data as an "issue."
- The organization is running one or more initiatives around master data management (MDM), in an effort to get its data under control.
- The organization is investing in large-scale data ingestion but has not made similar investments in the rest of its organizational data cycle.

These are representative of the symptoms that our customers shared with us in our research. The list grows by the day, but the general groupings of these symptoms have led to the models and constructs outlined in this paper.

Diagnosis

As our models imply, data metabolism is the effective use of data in support of one or more of the following: Discover, Develop and Defend. Organizations that are supporting these insufficiently will have different manifestations of ill health, and so each of their challenges will be calibrated differently. The diagnostics and tests for determining the nature of an organization's data disease include a wide range of analytic and evaluative services that are part of DXC's solutions portfolio.

The diagnosis process itself follows the Discover, Develop and Defend constructs we have developed. With knowledge and training, customers are enabled to self-diagnose their own data challenges and to measure the cost of suboptimal decision making.

Treatment

In treatment, organizations lay out a roadmap of how they must operate differently in the light of their current deficiencies, and the tools, metrics and monitoring needed to restore data health. Organizations that were not born digital will face a constant struggle to stay within the optimal data metabolism performance zone. To that end, treatment will focus less on cures such as data lakes, blockchains and faster reporting tools, and more on changed behaviors that will lead to better decision-making outcomes.

We recommend four initial steps to deal with an imbalance in the data metabolism of your organization:

1. **Acceptance.** Understand that your organization is suffering from a problem of ineffective decision making, not a problem of too much, too little or the wrong data. Until and unless this is recognized, there is little chance of improving decisions.
2. **Exercise your decision-making muscles.** Recognize that decision-making authority and time are two of the most valuable resources at an executive's disposal and are not to be wasted. Readjust your time, focus and attention accordingly. Further, automation of decision making is a necessary step in achieving the cybernetic organization we anticipate by the 2030s. Becoming comfortable with changing your decision-making abilities is a necessary precursor to embracing the future.
3. **Go on a data diet.** Adopt metrics that will force your decision making to kick into high gear. Then, and only then, should you invest in data, analytics and business changes that contribute to this higher metabolic rate for your organization.
4. **Use principles to guide you.** Adapt operational models to deal with huge amounts of data by replacing processes and rules with principles.

Summing up

Our research highlighted two pressing problems being experienced and debated in boardrooms across all industry sectors and geographies. The first is a cry for help to improve the quality of decision making; the second concurrent and equally taxing problem is dealing with the data tsunami. These two problems are connected in that undiscriminating over-consumption of data is impeding decision making by the leadership and delegated representatives of an organization. The malfunction is serious and prevents organizations from successfully evaluating and acting on the risk–reward criteria of any decision, or in some cases, from making any decision.

When we scrutinized this common pair of problems, we discovered a consistent underlying reason for the dysfunction: Organizations not born digital have not modernized their business and data processes and cannot capture, collate, analyze and disseminate data to the relevant people in a timely way. In other words, they're suffering from a poor data metabolism and are unable to convert insights into effective decisions.

In response to these findings and the clear need expressed by our executive cohort, DXC has developed a taxonomy, models and gameplay to describe an optimal use of data that improves decision making. Discover, Develop and Defend describe the three primary business outcomes of any organization. Helpfully, these three D's also provide a vocabulary and framework to understand the critical and supporting roles of data and actors in accomplishing primary business purposes.

Initiating data reform that supports better decision making is a substantial undertaking for most organizations. From symptoms to diagnosis to treatment, our team can assist your organization to achieve data optimization while steering you away from further data and analytic investments that will only compound an existing problem. We leave you with three coaching questions to consider as you retune your data metabolism.

Coaching questions

1. Governance and alignment

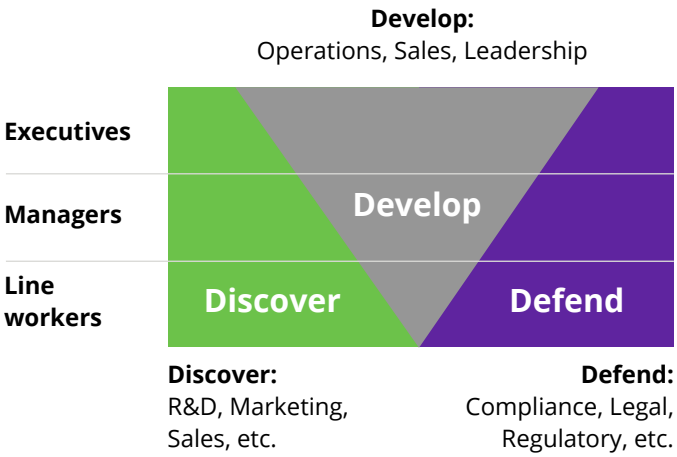
How well aligned is your business strategic focus with your data focus and activities?

Characteristics of an optimal metabolism

		BUSINESS INFORMATION		
		Gameplay	Gameplay	Gameplay
TYPE OF STATE	Business state	Explosive	Effective	Efficient
	Decision state	Discover	Develop	Defend
	Data state	Variety	Velocity	Volume

2. Focus and impact

Who are the primary beneficiaries of your data and insight activities, and how do they use data to make decisions?



3. Culture and literacy

What data and insights will help decision makers to better balance risk–reward decisions?

Learn more at
dxc.com/data-analytics

Get the insights that matter.
dxc.com/optin

About DXC Technology

DXC Technology (NYSE: DXC) helps global companies run their mission-critical systems and operations while modernizing IT, optimizing data architectures, and ensuring security and scalability across public, private and hybrid clouds. The world's largest companies and public sector organizations trust DXC to deploy services to drive new levels of performance, competitiveness, and customer experience across their IT estates. Learn more about how we deliver excellence for our customers and colleagues at **DXC.com**.