DXC TECHNOLOGY

Boosting data metabolism to improve decision making

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Organizations are suffering a crisis of decision making while also being overwhelmed by a tsunami of data.

Data metabolism is an organization's ability to digest data and derive actionable insights. Poor data metabolism prevents organizations from evaluating and acting on risk-reward criteria of decisions or, in some cases, making any decision at all. By focusing on three states of decision making — Discover, Develop and Defend — organizations can cut through silos, boost data metabolism and reach a new level of data-driven decision making.

As the global pandemic has shown, people's ingenuity and resilience know no bounds. When human intelligence is augmented by data and digital, businesses don't just survive — they thrive. By making the best decisions possible with available information at super-fast speeds, leaders have reinvented business models, restructured supply chains and spun up entire ecosystems. Microsoft CEO Satya Nadella said in an April 2020 earnings call that "we have seen two years' worth of digital transformation in two months."

While stellar success stories remind us that a brave new world of business opportunity awaits the bold, DXC Technology has discovered a lack of readiness in boardrooms. Our study into next-generation business operating models found organizations are suffering a crisis of decision making while also being overwhelmed by a tsunami of data. These two problems are linked: Decision making is being impaired by poor data flow across the organization.

At DXC we have coined the term "data metabolism" to address this. When an organization's decision makers are served relevant data at the right time and speed, and can derive actionable insights, then effective decisions can be made, and fast. That reflects a robust data metabolism. But an undiscriminating overconsumption of data, encouraged by app-centric organizations and individuals who expect instant gratification from data, is impeding decision making. That reflects an ineffective data metabolism.

The malfunction is serious and prevents organizations from evaluating and acting on the risk-reward criteria of business decisions or, in some cases, making any decision at all. As the world emerges from the pandemic and faces future external shocks such as climate events, it's clear that improving decision making by boosting data metabolism is a priority.
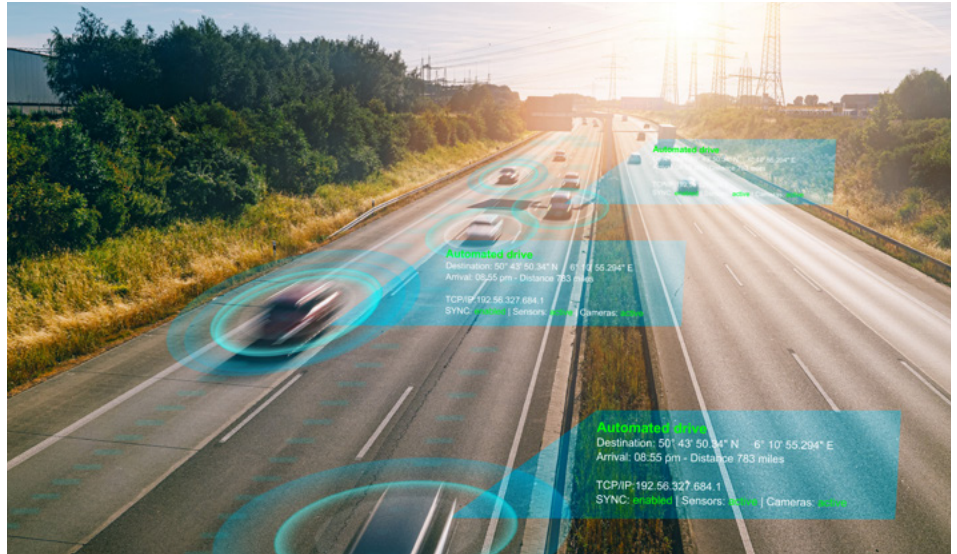
Data-driven decision making: Discover, Develop, Defend

We have created a taxonomy and framework that identifies three states of decision making: Discover, Develop and Defend. Organizations present the appropriate type and level of data for each state:

- **Discover.** *Business functions, processes and people use data to explore and research leads, products and services for R&D and sales activities*. An example is autonomous driving (AD), where automakers are managing a disruptive amount of complex data and an escalating amount of computation needs using solutions such as Robotic Drive. This has applicability for automated decision making in other highly complex environments.

- **Develop.** *Leaders use data to balance risk and reward in strategic decisions about operations that generate action, results and direction*. An example is collaborative procurement in the public sector, where insights are generated through an optimum balance of automation and human intervention to drive better value for how money is spent. This has applicability for managing spend control in other industries.

- **Defend.** *Compliance, legal and regulatory teams use data to mitigate risk and protect a company's assets, reputation and position*. An example is anti-money laundering and fraud management in financial services, where machine learning is used to highlight rule exceptions. This has applicability for supporting governance and control mechanisms in other industries.

There are three states of decision making: Discover, Develop and Defend. Organizations present the appropriate type and level of data for each state.

Seeing the enterprise through the lens of the three decision states cuts through the fog of thinking in terms of departmental silos, around which data typically and unhelpfully coalesces. In a siloed corporate culture, departments compete for funding to pay for the resources they are creating; too often this accelerates data generation, data duplication and siloed data insights. Instead, data insights — whether about consumer preferences and behavior, product life cycle, supply chains or data privacy — are shared cross-functionally by those doing Discover, Develop or Defend activity, optimizing decision making.

There is also confusion around what it means to be *data driven*, with organizations mistakenly spending on ineffective data lakes or campaigns to democratize data to achieve their aim. Becoming a data-driven organization is hard for any company not born digital; these companies tend to hold data in silos and have processes and procedures moored in the last century. An Economist Intelligence Unit survey found that six in 10 executive respondents (61%) reported having to cancel a digital project for lack of the right data.

Organizations that do not recognize and respect the distinctions between the 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 prioritize one of these three decision states, and therefore its 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, the organization's decision making will suffer.

Departmental silos in an organization are an increasing pain for most companies and are considered one of the largest detractors of innovation. Unfortunately, silos in most organizations have formed to focus specialized talent on very specific goals. These goals generally require each department or group to aggregate and analyze its data separately from others in the company. Because of this, decisions are made in departments rather than at a corporate level with a broad focus.

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Technologies and techniques for boosting data metabolism

Technology plays a vital role in developing a robust data metabolism that supports the value chain of action-insights-data. (See **Figure 1**.) Decide what action is needed, identify what insights support the action or decision, and manage your data accordingly. Let's examine this value chain and how businesses can strategically use technology to metabolize data.
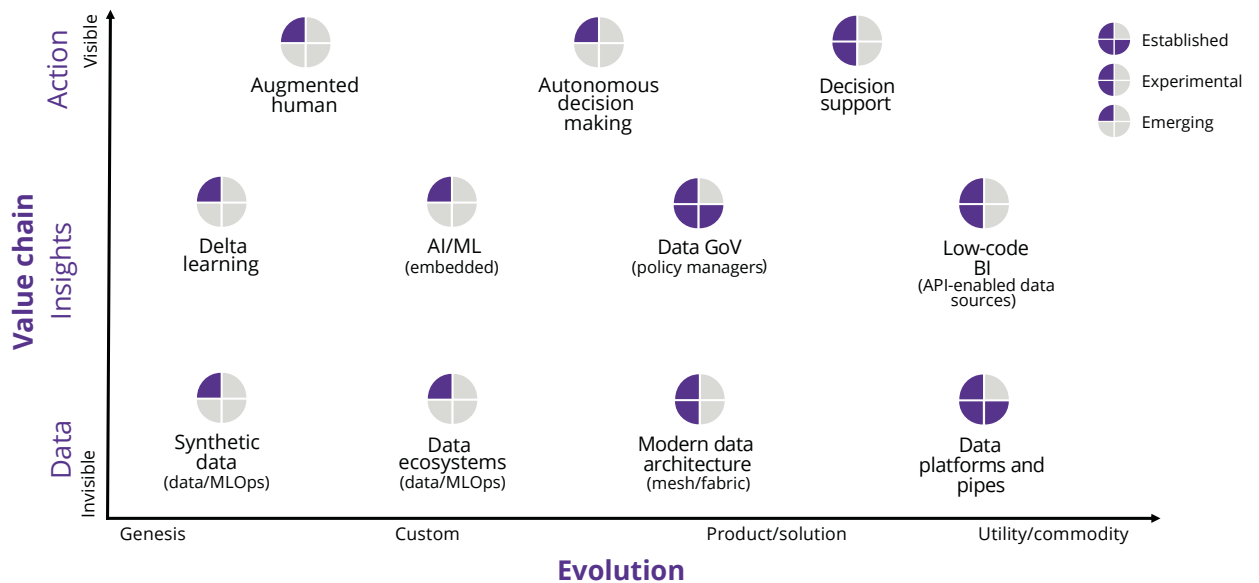
Figure 1. Technologies that boost data metabolism and actionable insights

Decide on the action

What is the decision (action) that needs to be made? Determine if it is Discover, Develop or Defend. Until now, emerging technologies have largely been specific to an industry and to the Defend state. For example, autonomous decision making is being developed for autonomous vehicles, whose data metabolism builds on many key factors, including:

- Specific outcomes and defined needs — public safety, efficiency and new driving culture

- Trusted and untrusted data generators, through both open and closed systems

- Embedded artificial intelligence (AI), iteratively developed through the aggregation of relevant data

Yet automated decision making also has relevance to many adjacent industries and services. Timeliness of decision making will become critical. The speed at which actions are executed will always be dependent on the volume and velocity of data and its proximity to the application and service that need to execute it. This means we will see actions at the edge as well as within the core centralized systems.

Embedded analytics will create actions that will be timely and accurate, supported by these factors:

- **Actions will be completed by both humans and machines.** Integration of these insights into other business systems and/or third-party systems will enable a better-integrated digital supply chain, thus supporting further autonomous or augmented decision-making capabilities.

- **Development of AI systems, with AI embedded directly into applications and systems, will enable the integration of AI engines and applications.** Continued exploration into enhancing cognitive AI will eventually codify the human senses. Advanced natural language processing (NLP) and optical interfaces will increase the number of systems and solutions that can be highly automated and create more interactive services.

- **NLP combined with AI and machine learning will enhance the experience, increase the speed of data flow and reduce errors.** Customers will continue to see enhancements in AI-driven chatbots, which will become more personalized and create a more interactive experience. But new challenges around trust will arise when we cannot tell whether we are talking to a human or a machine.

As these technologies and their adoption continue to mature, technology will increasingly enable the Discover and Develop states, in addition to Defend.

Identify and derive insights

Technology can enhance the creation of insights to support the three states of decision making. Increasingly, emergent practices in AI will democratize access to data-driven insights and decision making.

One of the key challenges to greater adoption of AI is the underlying effort needed in pattern recognition training. Experimental techniques such as delta learning have the potential to dramatically reduce the retraining efforts that AI requires today, by increasing learning as needed.

As AI technologies improve, there will be a reduction in specialist skills needed to code AI and business intelligence (BI). Low code AI is currently experimental but offers the opportunity to increase access to AI/BI tooling.

Machine learning ops (MLOps), which uses iterative methodology to develop, test, deploy and manage developed analytics, will further enhance the speed and quality of insight provision. MLOps provides a framework and methodology for increasing the pace and accuracy of data and analytics projects. Insights are improved through higher-quality data and the inclusion of more validated data through integration with other services.

The democratization of developing insights through low-code and no-code platforms will create a new set of challenges due to the proliferation of analytics. Supporting citizen development of AI will require a new methodology and framework that is yet to emerge and will require similar skills and disciplines to that of the open-source development world.

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Manage data

Technology improves access to broader and deeper sets of data, including inputs from a growing number of internet of things (IoT) devices and synthetic data (anonymized replica data). This is creating a shift from just-in-case data storage to interconnectivity of data ecosystems as needed by the business and its partners.

The data layer is going to become the foundation where insights and actions are based. Access and pooling of data have been the predominant practice to date, leading to the creation of data lakes, but emerging techniques around synthetic data combined with access to data ecosystems will allow for increases in Discover activity at much lower cost.

Business best practice for good data for Discover requires:

- **Data tagging and data security.** Many AI projects fail because of issues with quality of the data or access to the data at the right time.

- **Data governance through modern AI-driven master data management (MDM).** This requires new methodologies creating loosely coupled data fabrics that allow the organization to understand the relevance of data, the speed at which data will enter the systems, data quality and the value it will drive.

- **AI and ML-driven data policies.** The volume and velocity of data cannot be managed through human (manual) data policies. An AI/ML approach will ensure that data meets the compliance and regulatory needs of the organization while enabling connectivity and access to it.

A modern data architecture is a critical component of the data layer. The data layer will continue to evolve to keep pace with the adoption of ML, composable architectures and edge-computing environments. Data mesh will become an important evolution of the data warehouse and data lake. Data mesh allows organizations to operate a distributed data architecture that supports microservices and has the flexibility to support businesses in a state of constant change.

These new architecture and design principles will be key to enabling business scenarios to run at scale. This necessitates a reskilling around modern data architecture practices. This reskilling will need to be a business decision based on how data will relate to organizational environments, and whether the approach to skills development will be top-down or bottom-up, depending on the environment and use cases.

Data discovery and policy management for an AI-driven organization will support MDM on the data mesh. This will guarantee regulatory compliance is achieved, as well as protect the organization from drowning in its own data. New approaches to data tagging will ensure that the volume and velocity of data are managed for relevance, quality and value to deliver on business needs.

Perhaps the most important concern of the data layer is security. Data needs to be protected and managed correctly, with established access control mechanisms in place. The ability to log and understand data sets and ownership changes will be critical.

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Encryption and protection will be vital along all points of the data journey, from creation to presentation. Encryption will evolve to include amorphic technologies. Security as a process occurs through the adoption of AI SecOps, which will deliver prediction, not just prevention. This will enable event-driven actions that respond quickly, before issues arise, and alert other systems and operators.

The key benefits of investments in data-driven activities must support strategic value.

Maintain a strategic focus — six factors to review

All data and analytics initiatives should be closely aligned to business strategy and goals, with their governance integrated. Thus, the key benefits of investments in data-driven activities must support strategic value, such as:

- Reduced time to value in Discover activities (e.g., development of new molecules in support of drug development)

- Improved risk-reward balancing in Develop activities (e.g., timely decision on which drugs to take to clinical trials and which formulas to progress to next stages in these trials)

- Reduced cost of Defend activities (e.g., automated assessment and response to high volume of data as product is mass produced and adopted)

It is imperative for leaders investing in data and analytics programs to undertake an extensive review of the value and impact these programs will deliver. This review should include six factors:

- **Organizational governance.** Ensure strong alignment between business and data governance. Make it explicit which state of Discover, Develop and Defend each insight needs to support.

- **Results/outcomes.** Align the objectives to business outcomes with accountability for decision making.

- **Culture.** Provide the capabilities to do risk-reward balancing in decision making, particularly when focused on Develop decisions.

- **Literacy.** Invest in decision makers to give them the skills needed to turn insights into actions.

- **Data perspective.** Challenge existing data sets to ensure access to the variety of data needed to avoid bias.

- **Data engineering.** Industrialize and automate data management capabilities so that it is possible to speed up the provision of insights.

In this period of the Accelerated Now, organizations will be constantly discovering, developing and defending — these are the essential traits of business change. As a robust data metabolism becomes part of the fabric of organizations and decision making, the three states of Discover, Develop and Defend will provide guidance for boosting data metabolism. With data the food for business, a robust data metabolism is essential for a healthy business and data-driven decision making.

About the author

Mohammed "Khal" Khalid focuses on working with DXC Technology 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, Khal has strong coaching skills and is prepared to be open and vulnerable with colleagues and customers to help them achieve results. Connect with Khal on LinkedIn.

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