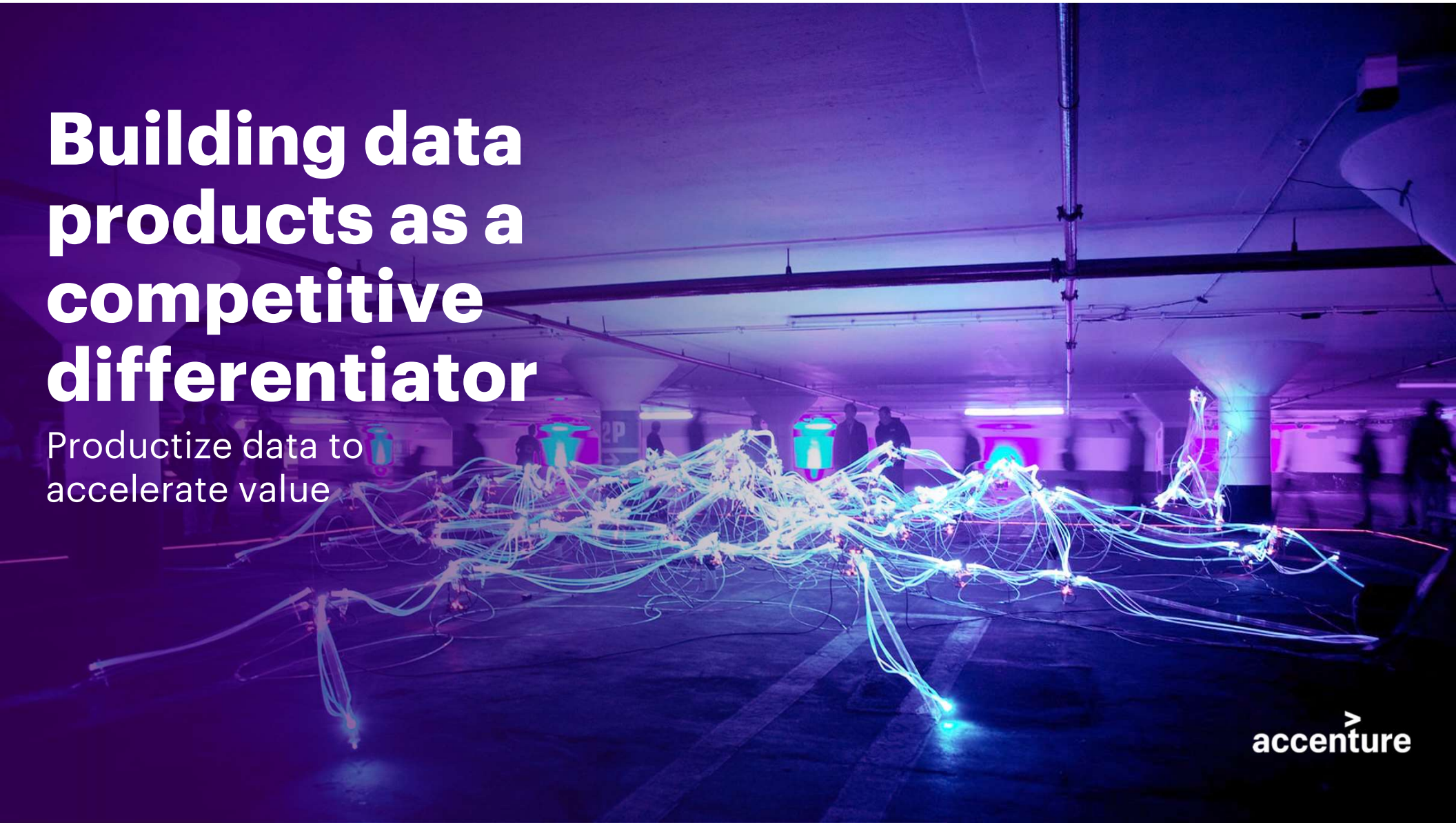

Building data products as a competitive differentiator
Productize data to accelerate value
accenture

Contents

Introduction

Data is a powerful new form of capital. It's essential for organizations to survive and thrive in today's fast-paced business environment. That's why we believe that every CEO should be as strategic about acquiring, growing, refining, safeguarding and deploying their data as they are about traditional business capital. Today, data is generated everywhere. It comes from humans, machines, Internet of Things (IoT) devices, edge systems and more—here on earth and even in space. All that data adds up. In fact, a staggering 2.5 quintillion bytes of data are generated each day.[1]

CEOs who see data as capital can grow and reinvent their businesses to be data-driven. The 2021 Chief Data Officer (CDO) Survey by Accenture and MIT[2], 78% of CDOs told us that their most critical responsibilities are driving business growth and value creation.

So, what does it take to become a data-driven enterprise? It means maximizing the value of your data and treating it as an asset differentiated by its completeness, maximizing the potential value, lineage, quality, and ease of use. It means basing critical business decisions on high-quality data and analytics, instead of tribal knowledge. In short, it means thinking of your data, and the analytics that rely on it, as a "product"—one that's essential for driving business outcomes.

This raises another question: What is a data product? Simply put, it's "a product that facilitates an end-goal through the use of data[3]. It's data packaged with everything someone needs to understand that data and use it to solve a new use case. The person can come from a different team or even from outside the business. Just like consumer products, data products are designed for specific purposes. Let's take a closer look at what data products are and see some examples. We'll also explore how data products differ from traditional approaches to using data.

Project vs product approach to data

Today, most companies approach enterprise data with a project mindset. In other words, a business function has a specific problem that it wants to solve with data. It then starts a project to acquire the data from the relevant sources, cleanse and prepare it, then analyze it for the specific use case. And each time a new business problem or use case arises, it follows a similar process to acquire, prepare and analyze data for its specific need.

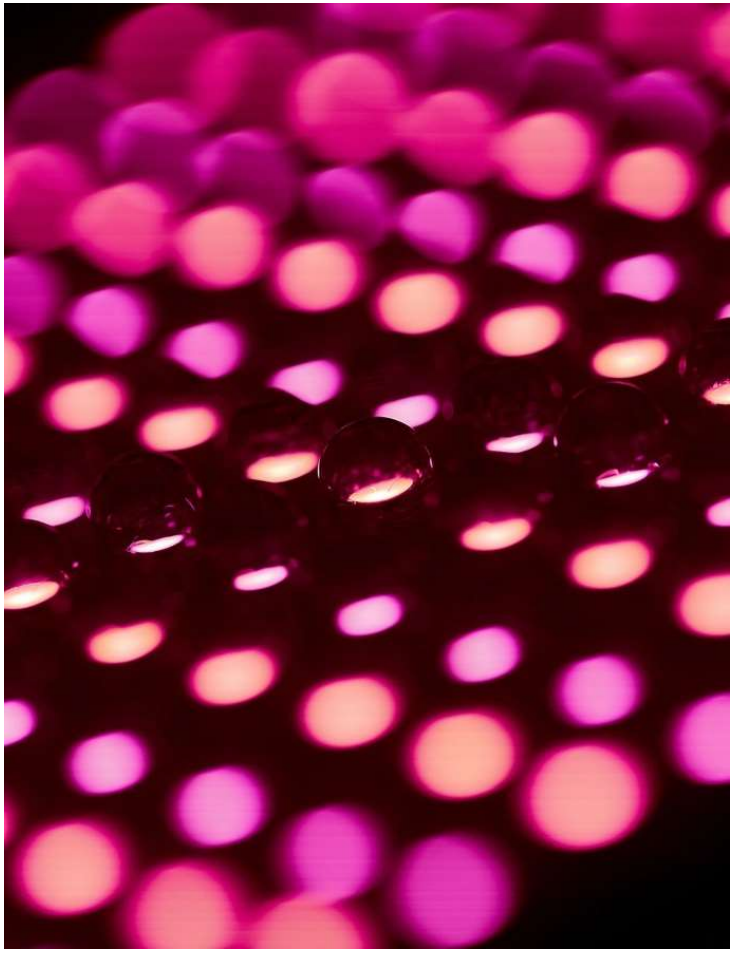
This project mindset may sound familiar. It's how most data teams currently operate. But this approach has some significant drawbacks:

- **It may lead to duplicated work**
- **It's relatively slow**
- **The outputs from each project typically can't be repurposed to solve other use cases**

Data products provide companies a better way to address their data needs. First, the data team determines the organization's data requirements, looking at individual business units and across the enterprise. Then, they create reusable data products that help multiple business functions solve different use cases. Data products can be:

- **Data**—reusable datasets, streaming, feeds, and APIs (Eg for design, manufacturing, finance and operations) that meet the needs of the whole enterprise, as well as each business function.
- **Code**—feature code and transformation snippets (small blocks of reusable code) or data models (representations of the logical structure of how different data elements fit together).
- **Analytics models**—reusable machine learning models (eg for predictive maintenance)
- **Dashboard reports**—reusable dashboards and other visualizations (eg a risk dashboard).

Data products typically offer far greater ROI and lower cost-per-use than data projects. Why? Because although the upfront costs may be higher, they evolve to support multiple outcomes over time and accommodate new use cases that emerge. The product mindset keeps the focus on realizing the business use cases. They offer an innovative way to decouple data from specific applications and use cases to maximize its value. And they help break down data silos across the enterprise.



Data products also offer several key advantages for the people who use them. These include:

Speed

Time-to-insight is much quicker, because the data product is pre-built. That means people don't have to start a new project each time they want some data.

Trust

Users know that data products have gone through rigorous quality control

Real-time information

Unlike static datasets, data products provide real-time data for decision-making.

Accessibility

The relevant data is already available, so people don't have to go and ask another team for it.

Usability

A well-defined data product with a well-defined interface is much easier to consume than a raw dataset.

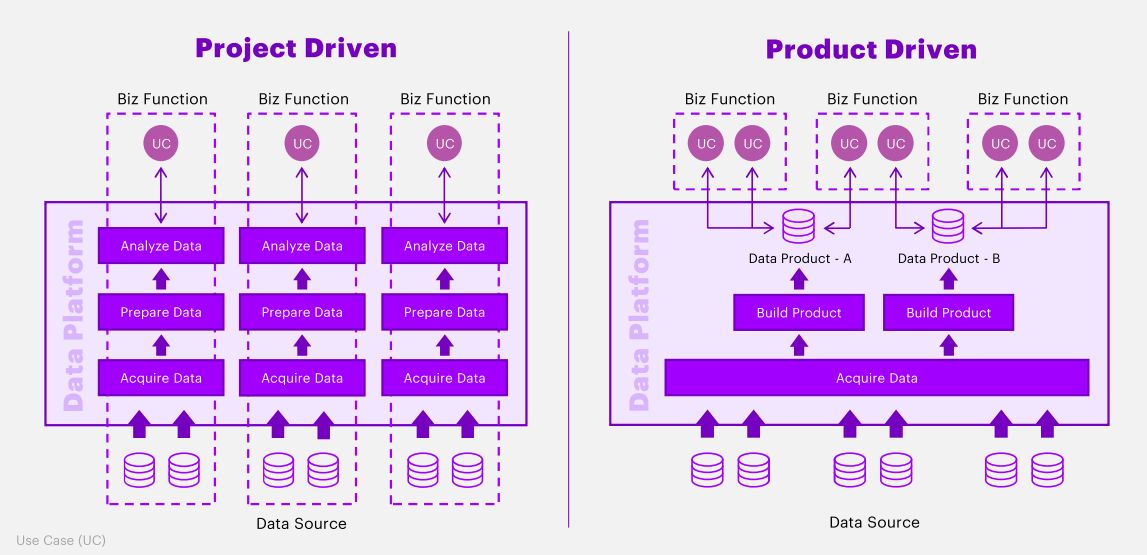


Figure 1: Project-driven vs product-driven approach to data

Data products in action

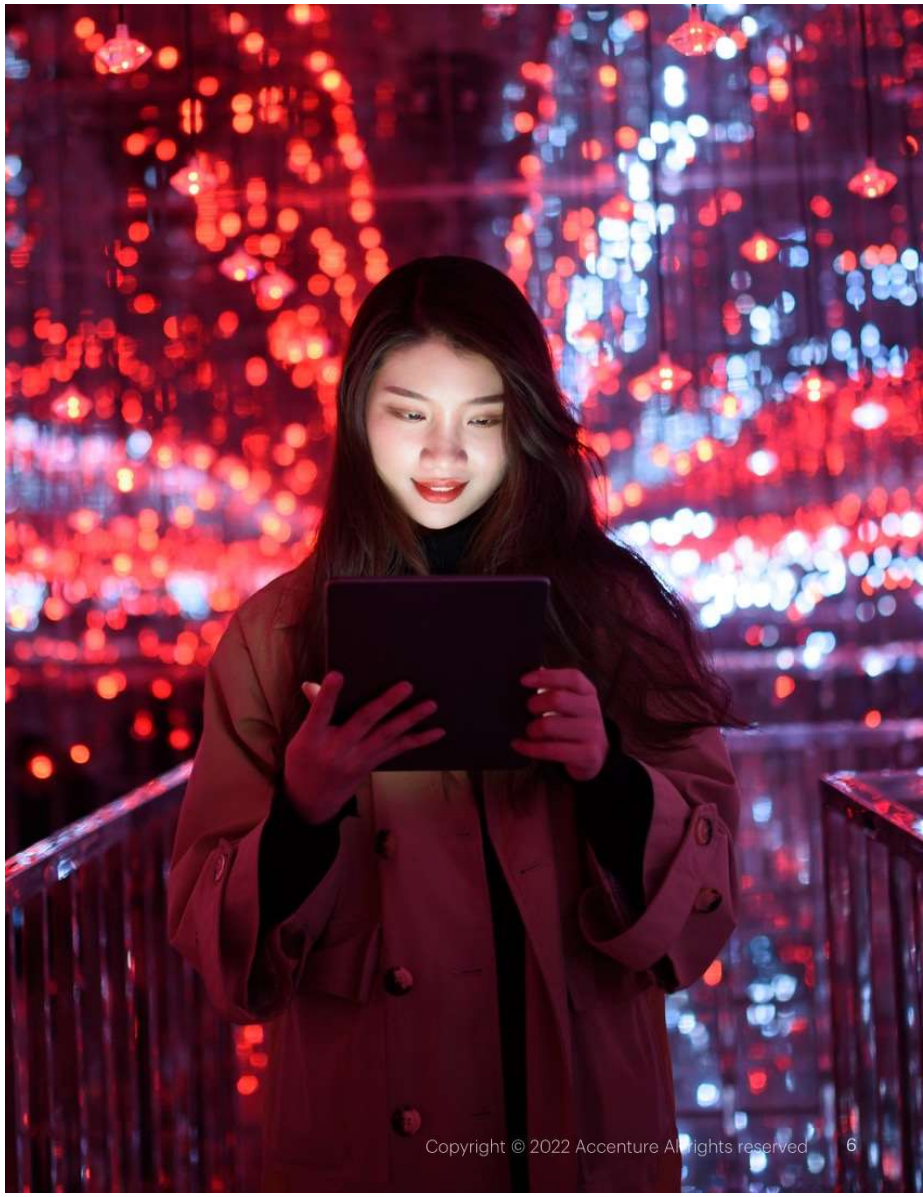
Powering digital natives

You may not realize it, but you're probably already familiar with some data products. In fact, many digital natives have built their entire businesses around them. Just think about Google, Uber and Netflix. They compete on their ability to drive actionable insights from their data. They have huge volumes of data that are constantly updated in real time. And this data can be instantly accessed by everyone in the business who needs it—without the need to set up projects to share data between teams. So, for example, people on the Uber Eats team can see which customers also use the company's ride-hailing service.

Huge potential for established businesses

Data products aren't just for digital natives. They offer huge potential for established companies, and they can even open up entirely new revenue streams. So, for example, a medical device manufacturer can start supplying medical-grade data services to healthcare providers to help drive better patient care. An oil and gas producer can achieve greatly enhanced efficiency in its plants. Or a media and entertainment company can serve personalized content to its customers.

Another example? We've helped many clients create a customer journey data product that encompasses all details of customers' interactions with a company across all channels. This data product enables multiple use cases—from understanding each customer's channel preferences to upselling new products and improving customer service. The product's value is in providing a single, unified view of the customer to all business functions.



Transform data into a competitive differentiator

Enabling new digital products

A farming equipment manufacturer can transform from selling machinery and maintenance services to offering data and models as differentiating products. The key? Opening up new business opportunities by adding IoT sensors to its farm equipment.

For starters, IoT data enables the company to introduce new remote diagnostics, optimization, and predictive maintenance services. What's more, the smart farming equipment unlocks unique visibility of the land being farmed—and the farmer's approach. This enables the company to provide rich insights into critical factors like soil quality, temperature, and humidity. In doing so, it can become a player in an ecosystem focused on maximizing farming productivity—working with futures markets, chemicals companies, insurers, and others. And it can transform and future-proof its business by using data as a powerful competitive differentiator.

Characteristics of data products

Data sitting idle is largely worthless. Its value comes from use and the outcomes it enables. So just like consumer products, data products should be reliable, high-quality and easy to use. Most importantly, they should focus on driving maximum possible value for the end-user.

Data products should also be:

- **Composable**: Composability means the individual components can be developed and evolved as products. Core data products are based on foundational data that is key to supporting the business. Other products can be derived (composed) by combining multiple core data products (see Figure 2)
- **Discoverable**: This ensures data visibility and democratization, and prevents duplication of effort
- **Interoperable**: Different data products can connect together, because they interoperate (E.g., they have similar interfaces). This interoperability supports the composability point we mentioned earlier. It also prevents the creation of data silos through the use of non-standard technologies and standards
- **Governed**: Data products need proper governance. That means clear ownership, lifecycle management, security and access policies, as well as well-defined consumption mechanisms
- **Purposeful**: Just like any other product, data products should be created to fulfill clearly defined purposes and deliver demonstrable value to identified consumers.

Core and derived data products

Companies can adapt data products as their businesses evolve. For example, if an organization wants to expand with a new partner in a new region, it may need to create geo-specific views of each customer and add a new source of partner data. These can be maintained as new, derived data products that reuse much of the logic in the core data product. And just like the original, the derived data products can be used by people across the business.

The product mindset gives us the best of both worlds: It helps maximize reusability of existing data products, while providing the flexibility to create new and derived products to support emerging business needs.

Connecting insights from across the enterprise

Data products can deliver powerful insights by joining up disparate data from across the organization. Think about an energy company, for example. Right now, the organization probably stores its data on design (eg plant engineering design), operations (eg data from IoT devices) and finance in different systems managed by different teams. But by exposing the data as data products, the company can instantly piece the information together. This empowers people to see the current status and cost of a project in real time, without having to ask another team for information. These data products can act as the foundation for collaboration within the company and with partners.

And if the company connects these data products, they become even more powerful. They can form the backbone of a digital twin program that allows all teams to make decisions based on a unified view and use the same models to predict what will happen. For example, the company can see all data related to each asset in the refinery and how assets connect to each other. This enables the company to predict and optimize output under different conditions, perform predictive maintenance, and even improve future designs. These data products act as the foundation for collaboration within the company and with partners.

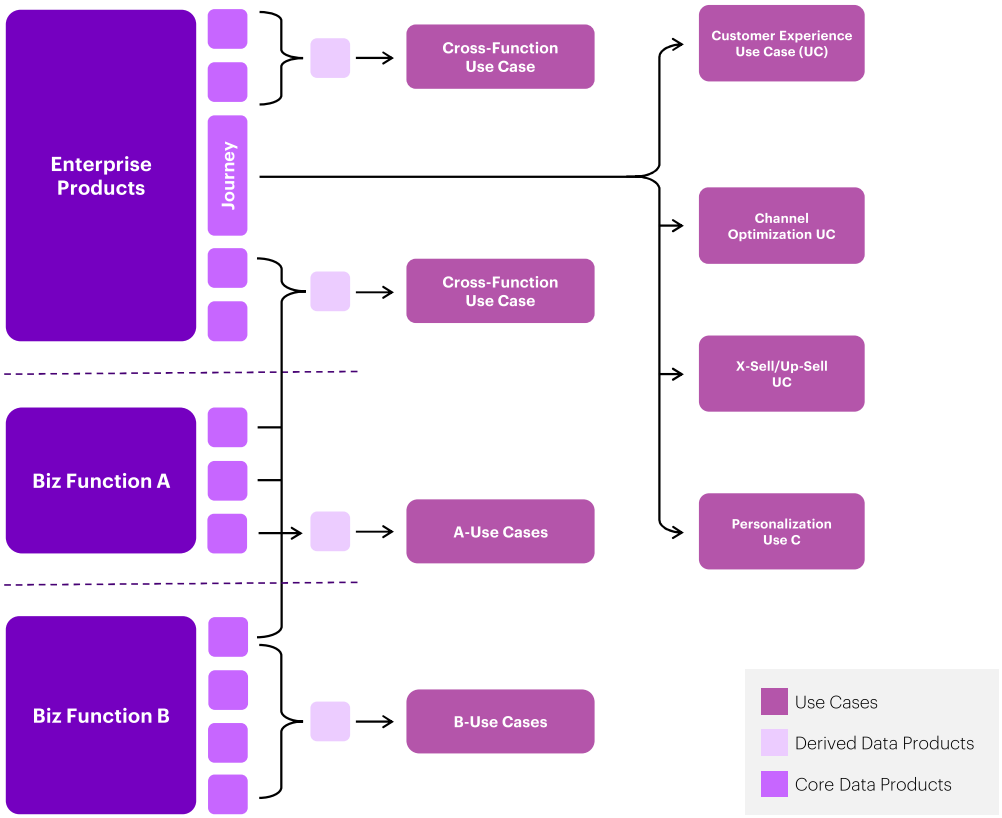


Figure 2: Core and derived data products

Lifecycle of a data product

Much like commercial products, data products have a lifecycle that consists of multiple stages. The product is conceived, then designed, developed, launched and managed in the market. Finally, the product is retired when the need for it diminishes.

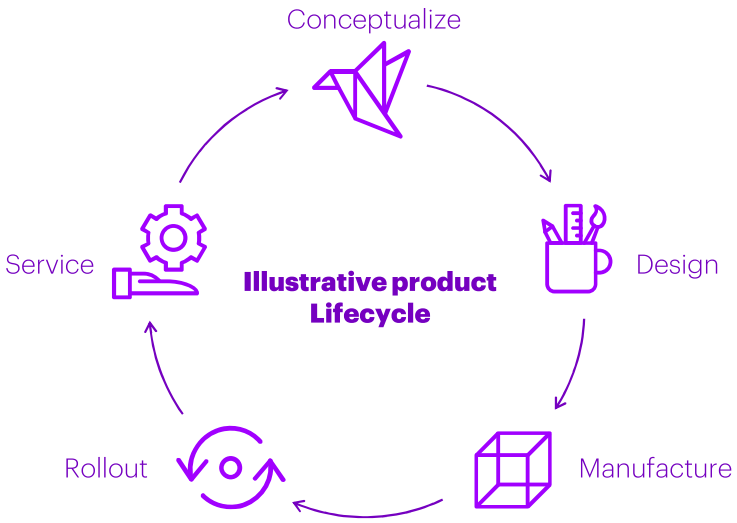


Figure 3: Lifecycle of a data product

Conceptualize—this stage involves understanding the needs of the business, variety of use cases and intended outcomes across the enterprise or within a business domain. This is crucial to ensuring that the product will meet the needs of end-users and deliver the expected ROI. At this stage, a product owner is assigned.

Design—this is a critical stage where the data product is defined. The team assesses the requirements and decides whether the product is a core foundational product (that needs to be created from scratch), or a derived data product that is composed of multiple core data products. They also make important decisions about the product's granularity. If a product is too granular, people need to do a lot of additional work to use it. But if a product is too broad, it won't have widespread appeal. In this stage, the team also create a conceptual data model for the product.

Manufacture—a cross-functional team comes together to create the product. Depending on the type of product, the team can include everyone from analysts, data engineers and DevOps engineers to data modelers, data scientists and visualization engineers.

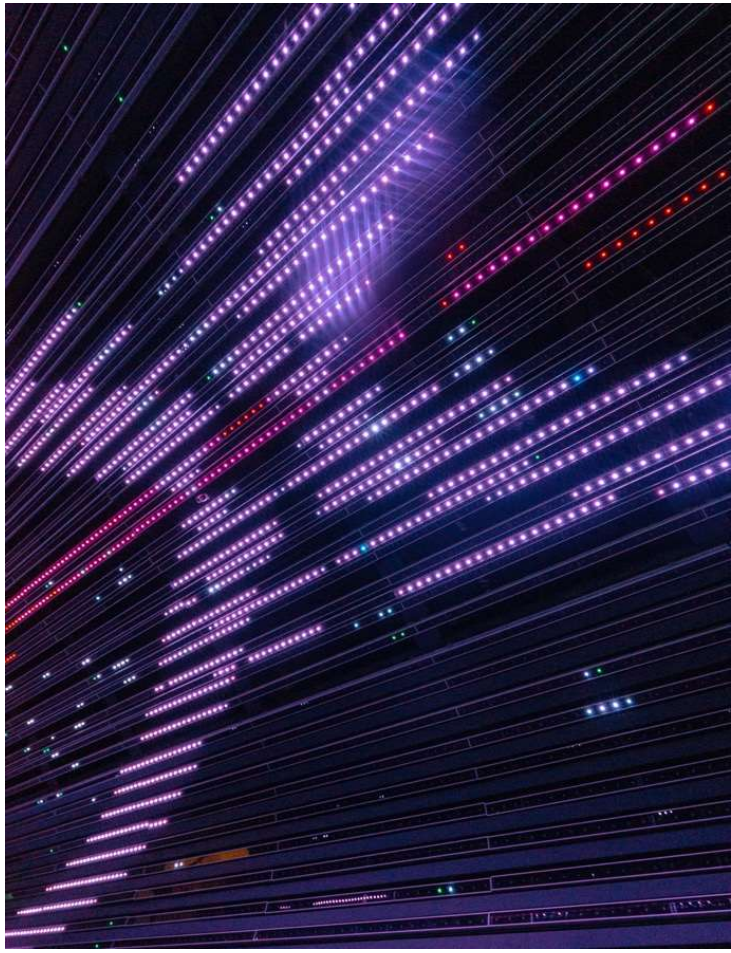
Rollout—typically, the team provides an initial minimum viable product (MVP) to a select group of users. This involves putting the MVP into production, setting up support teams, training users, and establishing mechanisms to track product usage. As the team iterates on the product, it rolls out new versions.

Service—once the product has been rolled out and people are using it, it needs proper support and services. The support team should monitor the data pipelines associated with the product. Centre of excellence (CoE) teams should be ready to advise people on how best to use the product. Stewards should continue to monitor product quality. And operations personnel should track product usage. When the product is no longer needed, it's retired. Any key learnings from the retired data product are used to inform future product designs.

Data product management—a new function

Because data products are designed to evolve and for reuse, they require ongoing management. This responsibility should sit with a new organizational function devoted to data product management. This team should be in charge of new product development, business justification, planning, quality, forecasting, pricing, launch, and marketing for all data products. Right now, this function rarely exists outside of digital-native companies.

Product management needs to ensure data products are built, managed and industrialized to meet business needs and deliver ongoing value. It must also ensure that cross-organizational standards and governance are applied consistently and at the right level based on the data product. And it manages data quality, service-level objectives (SLOs), master data management (MDM) and architectural improvements as data products move from beta to general availability (GA). To better understand this progression, let's look at the example of a medical device manufacturer. We've helped the company create three levels of data products that require different levels of product support:



1. **Internal within a business domain:** This "beta" data product is the raw, derived data product used to support a single business domain. For example, it could be an analytic record or dataset designed to help improve internal efficiency and decision-making. A central team may help with ensuring overall enterprise compliance—for example, for personal identifiable information (PII). The internal domain team chooses the right level of technology and business functionality to meet its needs. This data product delivers value by enabling data-driven work within the business unit.
2. **Cross-enterprise:** This data product is used by several business domains to drive outcomes. An example might be R&D datasets for scientific discovery and innovation across the organization. The business units must agree appropriate levels of SLOs, quality, and lineage for the data product. A central team can make this product discoverable in an enterprise-wide catalog. Plus, it can improve usability by providing an experiment sandbox that automatically stands up the datasets in environments to test hypotheses, and shuts down when done. The cross-enterprise data product provides reliable data for decision-making, and accelerates time-to-insight for other business units.
3. **External:** These data products are used by external partners and even third-party developers to drive collaboration and even monetization. For instance, this could be medical-grade data for healthcare providers. A central team can help ensure this product adheres to strict governance rules, and lands in a form factor that makes it easy to integrate with and consume. The product uses specific data technology, and adheres to the relevant business standards and ontologies. The external data product evolves not only by having unique data, but by having that data easily connected and integrated. Continuing with our example of the medical device manufacturer, here's a breakdown of the product management principles for these three data products

Figure 4: **Example of a medical device manufacturer with three levels of data products**

Vision	Users	Value	Technology	Usability and Delivery	Communication
Beta product (raw, derived and data work product)	Single business domain	To improve internal efficiency and/or decision making	Analytic record or dataset	Meets requirements for personal identifiable information (PII)	Internal communications
R&D datasets for scientific discovery and innovation	Across the enterprise	Innovation	Sandbox for experiments using synthetic data	Agreed SLOs, data quality and lineage	Enterprise-wide catalog
Medical-grade data products for healthcare providers	External partners	New revenue stream	For example, an API that adheres to relevant standards (E.g., FIHR for healthcare data) and enables integration with partner systems (E.g., by using the SData and OData protocols)	Service-level agreements (SLAs)	Cross-organizational collaboration

Transform data into a competitive differentiator

The right skills and technology to create and manage data products

To create data products, organizations need a broad range of data management capabilities. These include data acquisition, data integration, data quality, metadata management, data modeling, data cataloging, marketplace, data access and APIs, data rights management and data tracking. Companies also need cross-functional skills, such as business analysis, DevOps and data engineering. Plus, the teams creating data products need knowledge of the relevant industry and domain.

The fundamental goal is to use data as a competitive differentiator. That means organizations will want to be able to update and release new data products all the time. So it makes sense to create them in a data platform that is built in the cloud. Cloud enables scale, agility and the opportunity to drive reinvention. . It allows for data to be connected as a part of a larger continuum. And by tapping into the Cloud Continuum organizations are enabled to productize their data—wherever it resides. Indeed, many of our clients are unlocking value by harnessing the power of data and AI in the cloud.

At Accenture, we use these same practices to manage our own data products on our Accenture Data Platform. We've created ready-to-use data products—including insights, benchmarks, reports and dashboards—to support our data users and consumers such as executives, strategists and analysts. We've also built exploratory data products— E.g. curated data, AI models, APIs and data models—for our advanced data users, such as data scientists and data analysts. We use the Accenture Data Platform to orchestrate the commerce of these data products within our organization and our 650,000+ people. It provides a central marketplace for product consumption and usage analytics that gives us powerful insights, such as:

- **how well each product is selling.**
- **which new products we should introduce, based on frequent marketplace searches that yield no results.**
- **products that should be recommended to customers based on their interactions with other products.**

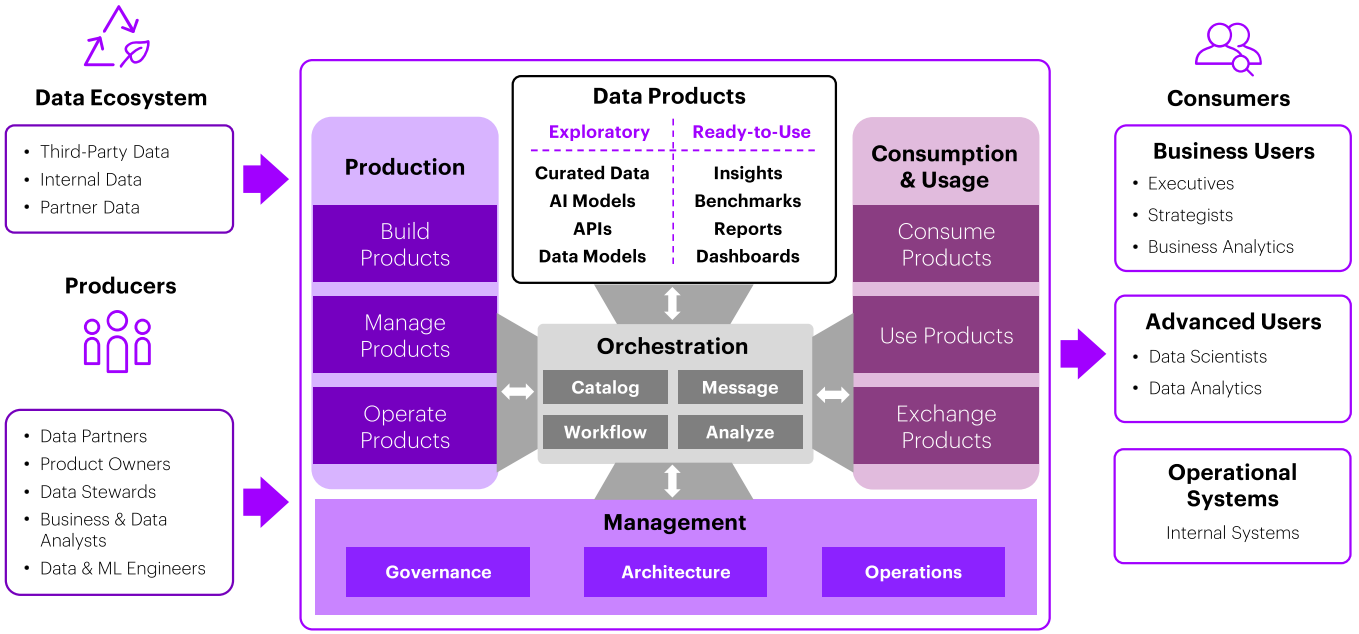


Figure 5: Accenture Data Platform—data products and data management capabilities

Summary

For most data teams, moving to a product mindset is a paradigm shift. It requires a mature data strategy that recognizes that data and analytics models are products that differentiate the business in the digital ecosystem. This means that the strategy should determine the business objectives—whether that's opening up new revenue streams, growing the customer base, creating personalized recommendations, or anything else. And it should outline how to obtain the data and models to best meet those objectives.

Building data products requires an industrialized data architecture where capability, technology stacks, mechanisms, and orchestrations are focused on maximizing data security and value. It uncouples valuable data from applications and use cases, enabling its easy reuse—both by the business and by the wider ecosystem of partners. It breaks down organizational silos and promotes a development process that is agile and dynamic. This can streamline innovation to help drive new data-powered business outcomes in an ever-changing market.

To create industry-leading data and models, organizations will need highly skilled cross-functional teams. The data and model lifecycle and DevOps processes should enable rapid iteration, so that the organization can deploy, optimize, and redeploy new datasets and models to best support the business.

Furthermore, companies should continuously examine and refresh their enterprise data, and the analytics models that derive actionable insights from it. A product lifecycle approach is necessary—one that considers everything from conceptualization and design to manufacture and rollout, as well as ongoing support. Technology-siloed, application-focused data architectures must become outcome-centric architectures. This will enable data to be reused multiple times to support partner ecosystems, data-enhanced products, and multichannel interactions with the user community.

Adopting a data product mindset lays the groundwork for organizations of all kinds to leverage data to achieve critical business outcomes. It's too big of an opportunity to miss.

Authors

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