

A New Paradigm for Business of Data

BRIEFING PAPER
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Executive Summary

COVID-19 is changing the world and how we use technology and data is changing with it.

The COVID-19 pandemic represents a watershed moment for the role of digital technologies in our lives. We have learnt how much we rely on them and how ingrained they are in almost every aspect of our day-to-day activities. And it seems clear that our future will be increasingly digital.

At the heart of the digital economy and society is the explosion of insight, intelligence and information – data. Data is the lifeblood of the digital economy. While the exponential growth of data has the potential to enable better outcomes and new value for all, the way businesses, governments and consumers use data can also exacerbate exclusion, the unequal concentration of power and wealth, and social instability. For businesses, understanding how to leverage data is a critical component to success. Businesses are challenged to balance opportunity with material risks in a highly complex, often emotional and fast-changing environment.

This paper captures replicable learnings and practices from organizations leading the way in ushering in a new business paradigm for data that empowers stakeholders, is grounded in ecosystem partnerships and creates sustainable value for all. It provides a starting point for an ongoing programme to develop new playbooks for executive action and share lighthouse innovations. Utilizing live, successful examples

from across the business community today, it highlights:

1. New opportunities for data-driven value creation, categorized into four archetypes: new value pools, new business models, richer stakeholder experiences and better decisions
2. Powerful technologies that are opening new possibilities for companies to protect their own interests and those of others
3. The new paradigm that these twin trends are driving – one that leverages stakeholder interests as a core design parameter in building sustainable and shared value

This paper is intended as a starting point to advance actionable understanding on this emerging set of approaches – to catalyse further replication, collaboration and innovation.

It also represents a contribution to an ongoing set of activities across World Economic Forum communities. Further resources are provided for additional reading on digital transformation, industry-specific views on data-driven value, data collaboration and policy, operationalizing end user agency through “good” digital identity and use cases that leverage data and technology for COVID-19 response.

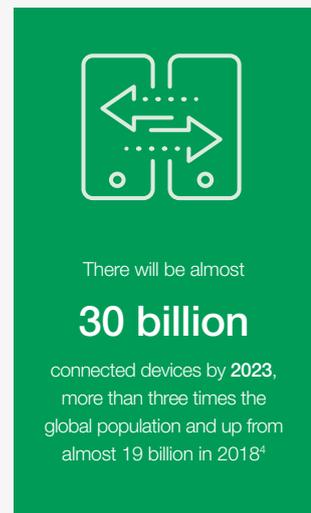
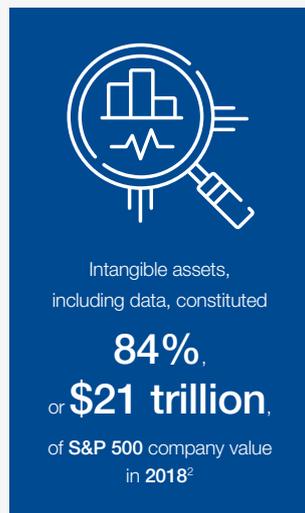
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Introduction – A Breakthrough Moment for the Business of Data

COVID-19 has dealt the world a twin crisis. We face not only our greatest global health shock but also our greatest economic shock in a century.

It has also provided a twin watershed moment. First, whether for school, work, health or keeping

in touch with family and friends, we have realized the deep value of digital technologies. Second, it is driving a deep and widespread attitude change – that we need to urgently reset the world’s economic foundations for a more equitable, resilient and prosperous future.¹



These are not unconnected. Business’s use of technology plays a crucial role in shaping a redefinition of economic and social systems. Digitalization is yielding vast quantities of data, which offers a wealth of possibilities for business, human well-being and the environment.⁵

In April, the Chinese government made it official: the authorities now recognize data as a “new factor of production”, reflecting how it is changing business models, industry boundaries and market structures.⁶ Used with wisdom, a more granular data-driven understanding of communities, individuals and cells, or of complex

natural ecosystems, industry value chains and materials can open new possibilities for well-being. Handled poorly, data and analytics can be used to exacerbate inequality. The former delivers benefits we cannot imagine; the latter delivers ills we can imagine all too well.

For businesses, however, to say that data is a driver of great value leaves out half of the equation. Many companies feel they lack maturity or actionable understanding. It is also a source of existential reputational risk or liability, regulatory constraint and commercial sensitivity.

Furthermore, value and responsibility are often seen as being on opposite sides of a scale.

However, a new wave of innovations in business models and technological capabilities – driven by companies across every sector and region – are changing the paradigm. This paper aims to highlight some of these innovations, to amplify the new art of the possible, spark debate with and across business communities and inspire a new direction of travel for business leaders, entrepreneurs, civil rights activists and policy-makers.



Businesses play a critical leadership role in defining a new paradigm for data through their business and operating model choices. While technological capabilities today are making it possible for companies to create immense value, organizations who can manage the fine balance between opportunity and responsibility will be the leaders of the future.

C. Vijayakumar, President and Chief Executive Officer, HCL Technologies

1.1 | New Opportunities Are Emerging...

The old way of using data analytics is through a focus on increased efficiency and better post-hoc decision-making. The new way is to use data to generate top-line value. The new use cases frequently draw on data from multiple sources, generate value for multiple entities and embed

both end user and partner interests. The New Opportunities section (on page 6) offers definitions and current examples of the four emerging archetypes of this data-driven value creation: new value pools, new business models, richer stakeholder experiences and better decisions.

1.2 | ... Along with New Capabilities and Technologies...

A maturing wave of technology capabilities enable companies to better account for the interests of multiple stakeholders. The New Capabilities section (on page 10) outlines some of the privacy-enhancing technologies (PETs) and related techniques that facilitate safe and efficient data usage and collaboration. Some techniques

allow organizations to generate insights without exposing the underlying raw data (consider the example of Points on page 11). Others allow companies to generate insights from data sets that remain fragmented across a range of original locations (consider the example of Hewlett Packard Enterprise on page 11).

1.3 | ... Driving the Emergence of a New Paradigm for the Business of Data

Leveraging new capabilities to protect the interests of all stakeholders opens new possibilities for market, revenue, experience and insight generation that is sustainable because all parties benefit.

Companies that demonstrate leadership in such models and practices not only are creating new

opportunities. Trusted relationships with customers build sustainable value, new partnerships leverage complementary strengths while protecting the core, and governments can be proactively supported in their goal to protect consumers.

2

New Opportunities

Large and small businesses are innovating data-driven approaches, increasingly motivated by rising market sensitivity to the interests of all stakeholders, not just shareholders. The following section outlines

four new ways of creating value from data insights accompanied by live examples of businesses putting stakeholder-centricity into practice.

FIGURE 1 Emerging opportunities for data-driven value creation

Archetype	Opportunity
 New Value Pools	 New revenue streams, products and services for a broader range of stakeholders, enabled by data insights and analytics
 New Business Models	 New collaborative business models, enabled by ecosystem partnerships combining data sets
 Richer Stakeholder Experiences	 More personalized, convenient and trustworthy experiences in lifecycles and contexts, enriched by data
 Better Decisions	 Analytics-based insights for better and contextualized decision-making, beyond improvements to operational efficiency

Source:
World Economic Forum

2.1 New Value Pools

New revenue streams, products and services, as well as richer insights for a broader range of stakeholders, all while ensuring privacy and security – these are the results some businesses are achieving through data insights and technology. They are exchanging and combining data sets, codifying and selling analytical capabilities, and engaging with new configurations of customers, providers and other actors to create new markets for value generation.



UP42, a subsidiary of Airbus, expands the market beyond the traditional customer base and makes it easier to find, buy and use geospatial products from existing providers. A single scalable platform brings together multiple providers of satellite imagery and geospatial data, analytics and machine-learning algorithms, democratizing access to this data and these capabilities. The company creates value for stakeholders across the whole chain – customers use data and algorithms to solve their clients' problems faster and marketplace partners earn a share of the revenue every time their data and capabilities are used.⁷



Instacart, the largest online grocery delivery platform in North America, is providing in-depth insights on shopping patterns across 5,500 cities to consumer-packaged goods companies. Based on its partnerships with more than 400 retailers and 30,000 grocery stores, as well as its millions of customers, Instacart's customer intelligence offering delivers not only underlying data but also anonymized details on product sales, category trends, out-of-stock information and basket penetration among new and existing customers. The result is new value to partners and a better customer experience for online grocery shoppers.



Hewlett Packard Enterprise (HPE) and Continental have created the Data Exchange Platform as a Service which is a marketplace for mobility data. It provides a secure, transparent, decentralized architecture for trusted vehicle sensor data sharing and payment, based on blockchain technology and smart contracts. It offers data sovereignty and includes a consent-management system for drivers. The platform helps car manufacturers provide more accurate in-car services, better driver assistance and other mobility services to reduce traffic congestion, increase safety and improve the driver experience.^{8,9}



Geospatial insights are more crucial than ever. Easy access to geospatial technologies will enable the development of innovative solutions, helping to solve some of the problems we face around the globe.

Dirk Hoke, Chief Executive Officer, Airbus Defence and Space

2.2 New Business Models

New, collaborative business models are addressing individuals' core needs and building trust – while enabling new business opportunities. They augment customers' data sets with external data, creating ecosystems for new opportunities and delivering a broader range of products and services. They embed privacy, security and agency.



Inrupt enables a distributed data ownership model. Instead of a company storing siloed snippets of personal data on their servers, users store it in interoperable online data stores (Pods – on page 12), giving them unprecedented choices over how their data is shared and used. They can, for example, share their fitness data with their health insurance company, or allow sharing between their thermostat and air conditioner. They can set time limits on sharing and change their choices at any time. Businesses and developers can access a rich store of personal information drawn from all aspects of an individual's life, unlocking innovative services, business opportunities, ecosystems and applications. By flipping the rules of who gets to benefit from data, Inrupt's technology lays the groundwork for the next era of business growth on the web.¹⁰



BBVA's data-driven banking strategy is based on a core idea: the customer owns the data and should be able to share it securely with whomever they want to achieve their ambitions, even if that service cannot be provided by BBVA. BBVA therefore opened its Application Programming Interface (API) Market to share data with fintech start-ups and

other stakeholders.¹¹ This open, dynamic ecosystem enables new collaborations, business models, use cases, value-added products and customer experiences.¹² As a further benefit, the partners using BBVA's API Market do not have to secure their own banking licences to provide financial products and services. Customers, partners and BBVA itself all benefit.¹³



The Machine Learning Ledger Orchestration for Drug Discovery (MELLODDY) is a consortium of 10 pharmaceutical companies, including Johnson & Johnson, AstraZeneca and GlaxoSmithKline, which is pooling data to train machine-learning algorithms and help develop new antibiotics. Blockchain and decentralized federated learning (on page 11) ensure traceability while allowing data to remain on individual companies' servers, protecting commercially sensitive and proprietary information. As the first instance in the pharmaceutical industry of a collaboration in which artificial intelligence (AI) models are both the enabler and the recipient of data sharing, MELLODDY is accelerating drug discovery, development and go-to-market times while reducing costs.^{14,15} It serves as a precedent for commercial partnerships for distributed and shared value creation for business and society.¹⁶



The business models that dominate the web today are not inevitable. Nothing is immutable. We have the opportunity right now to flip the rules of who gets to link the data together and gain insight from it. A shift like that will unleash a global wave of individual value creation and business opportunity just like the web itself did 30 years ago.

Tim Berners-Lee, Web Inventor; Founding Director, World Wide Web Foundation; Co-Founder and Chief Technology Officer, Inrupt

2.3 Richer Stakeholder Experiences

To sustain trust and engagement, businesses are using data to better understand consumers, employees and other stakeholders in lifecycles and contexts, offering personalized products, tools and services and a seamless experience. Businesses are also mastering ecosystems, collaborating with or acquiring other actors to connect their customers with other service providers and offer a richer experience.



Ping An, which serves 200 million retail customers and 516 million internet users, has transformed itself from an asset-heavy financial institution to an asset-light technology company, offering an ecosystem of personalized services focused on core needs in health, smart cities, mobility, finance and housing. In housing, for example, Ping An has created an ecosystem with multiple providers to meet clients' full housing needs: to find, sell or rent a house, secure a mortgage and insurance, and even find discounts for housing renovations. Ping An captures data through this platform, enabling it to deliver still more value. Ping An's 10 platform ventures have already generated over \$10 billion in net new revenue.¹⁷



Dassault Systèmes acquired Medidata to strengthen its 3DEXPERIENCE platform, which combines data intelligence and digital simulations to enhance the process and experience of research, development, production and commercialization. 3DEXPERIENCE creates virtual twins (on page 13) of products, facilities or people which stakeholders can

visualize, share and assess to bring personalized medicine and patient-centric experiences to the public quickly and safely.^{18 19} For COVID-19, the platform is facilitating drug repurposing and clinical trials, the supply of critical medical equipment, rapid hospital design and construction, and remote work capabilities and education.²⁰



Digi.me, a personal data marketplace, has already enabled consumer data ownership for more than half a million users. Users compile personal, financial and health data, then establish parameters for sharing and selling their data. Instead of collecting data from consumers, businesses and developers ask them to consent to share it in exchange for value, such as a product, service, convenience or reward.²¹ Companies find a new data model centred on the individual, which ensures a single source of data, with richness, robustness over time, accuracy and ease of use. Individuals receive value, agency, privacy and consent, all of which encourage more data sharing. The platform has already enabled use cases spanning health and well-being, finance and banking, and government agencies.^{22 23}



We must ensure the 'data revolution' is a revolution for people and the planet. We need to recognize that users are the true 'owners' of the data they generate and allow them to share it across sectors and borders in order to foster sustainable development, inclusion and equality.

Carlos Torres Vila, Chairman, BBVA



The heart of digital transformation is trust in data. Without the right data, conscientiously mined, managed, protected and applied, companies will lose what is now their most precious asset – trust.

Paul Daugherty, Group Chief Executive, Technology; Chief Technology Officer, Accenture

2.4 Better Decisions



By 2025, **49%** of the world's data will be in public cloud environments; nearly **30%** will be real time, allowing for faster and contextualized decision-making²⁴



Highly data-driven organizations are **3x more** likely to report significant improvement in decision-making²⁵

Analytics-based insights are helping companies make better decisions in areas ranging from business process optimization to supply chain management, go-to-market strategies and more. Many use cases depend on partnerships and ecosystems on data that go beyond company boundaries.²⁶



Aera Technology is using big data, machine learning (ML) and AI to develop cognitive automation in the supply chain, offering real-time visibility into demand, supply, production and inventory performance.²⁷ With a Google-like search interface, users ask questions and derive contextualized insights and results through built-in analytics, bolstering trust in guidance and decision-making.²⁸ Aera has also launched a cloud platform for cognitive automation, allowing customers and partners to access this technology flexibly and at scale, and operationalizing change by digitizing institutional expertise and experience.²⁹



Kabbage, a financial technology and data company, is automating small businesses' access to working capital. In collaboration with the United Parcel Service (UPS), customers can provide access to their transactional shipping data to inform Kabbage's financial assessment of companies, automatically underwriting decisions to provide small business loans.³⁰



Ocean Protocol, a decentralized data exchange protocol and network, uses blockchain and decentralized federated learning (on page 11) to unlock data services and marketplaces. Users can find, exchange and monetize data with privacy, security, auditability, transparency and compliance. Data owners have agency over their data and its pricing, while data buyers can build AI models that train on data that never leaves the platform – allowing the data seller to retain privacy and control. In Singapore, wellness and healthcare company ConnectedLife and other industry partners have used Ocean Protocol to share and analyse sensitive healthcare and smart home data to improve care and independent living for people with chronic conditions. The resulting insights can also be sold to home care and insurance companies for improved product design. Roche Diagnostics is using the platform to support secure, real-time sharing of medical data from self-monitoring devices to assist health professionals with decision-making for patients on blood-thinning therapy.^{31 32}

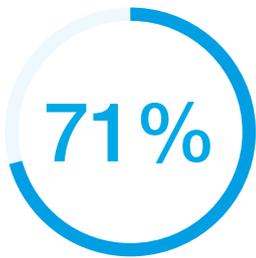


The explosion of computing power, bandwidth and storage presents an unprecedented opportunity to increase the quality, accuracy, and speed of decision-making by harnessing the vast troves of data that digitalization is yielding. When used responsibly, data unlocks new levels of agility, utility, and societal value.

Frederic Laluyaux, President and Chief Executive Officer, Aera Technology

3

New Capabilities



71% of executives expect the volume of data exchanged with ecosystems to increase³³

In an increasingly AI and data-driven world, realizing value from data will require collaborating outside company boundaries, even with competitors. Within the manufacturing industry, for example, sharing data among companies can likely unlock more than \$100 billion in value, just from improved operations.³⁴ Yet data sharing is not easy. Data sharing – and even data activities within an individual organization – are often held back by commercial, reputational and regulatory risks and immature capabilities.

To meet their own needs as well as those of their partners, individuals and society, businesses must answer three key questions about data:



How do I use data to address each customer's needs while building trust through security, privacy and agency?



How can I partner with others to benefit from multiple data sets, while protecting the interests of all involved, including my partners and customers?



How can my business and operating models scale while meeting a host of diverse regulatory and policy requirements?

Organizations are increasingly leveraging a set of existing and emerging technologies and non-technology approaches to address these questions and create value for all stakeholders.

TABLE 1 Stakeholders' interests

	 Individuals	 Government	 Business partners
Interests	Privacy, agency, security, personalized value	National security, criminal justice, public health and safety, competitiveness, trade and consumer safety	Growth, protection of commercially sensitive information, compliance and reputational risk
Business design parameters	Consumer choice	Regulation, policy, incentives	Contractual agreements, technological capabilities
Example enablers	Personal online data stores (Pods)	Distributed insight generation, data sharding	Trusted Execution Environment (TEE), Multi-Party Computation (MPC), decentralized learning



The digital economy is a new driver of economic value and data is becoming a new asset class. A new generation of cutting-edge technologies is breaking data siloes, enabling new use cases for businesses and empowering data providers to reach the full potential of their data – all while preserving privacy, security and trust.

Sarah Zhang, Founder, Guangzhishu Technology, Points Technology

3.1 Technology Enablers

Technology tools can enable data sharing and use, whether through APIs and platforms (consider the example of BBVA on page 7), or privacy-enhancing technologies (PETs) and other mechanisms described below that are maturing for joint analysis and insight sharing without exposing raw data.^{35 36} This is especially relevant in the current regulatory landscape, with data privacy laws such as the General Data Protection Regulation and the California Consumer Privacy Act coming into effect, and the recent revocation of the Privacy Shield agreement, which makes data sharing between companies in the European Union and the United States even more difficult.³⁷ PETs also show promise in tackling COVID-19 by balancing public health and privacy.³⁸ PETs and other tools are enabling value creation while keeping sensitive information confidential and traceable, helping business to preserve competitive advantages and meet diverse regulatory requirements.

These innovations, along with new human-centred business practices, do more than address business challenges. They also empower stakeholders as well as preserve individual agency and privacy. New data stewardship models (such as data exchanges, collaboratives and trusts), personal data stores and account aggregators are just a few examples.³⁹ A new role is emerging too: dedicated data service providers or data custodians who democratize access to data, take responsibility for its privacy and offer it as a service to other businesses, which can then use it to improve products, services and the customer experience.

Trusted Execution Environment (TEE)

A TEE, also called a secure enclave, is a hardware-based environment that processes data with chip-level encryption. When unused, the data is encrypted. While used, the data is protected and isolated, especially when the data owner is not the sole party running processes on the chip, as often occurs in the cloud.



Points uses a confidential computing framework based on a TEE, enhanced with additional encryption technologies, to make data usable but not visible to

multiple parties. Without exposing data to each other, data owners collaborate on computational tasks and predictive model training. Payment servicers are using Points to allow banks to train credit scoring and marketing models on its data; they receive post-transaction data in return. Financial payments companies also use Points to work with banks to guide marketing of specific products, such as wealth management, without sharing the underlying data.

Decentralized Learning

Decentralized learning uses data distributed across multiple locations to train one shared ML model. Data is processed without ever leaving its original location; only the learnings go to the central model. This technique preserves privacy and makes training possible when the relevant data is not in the same place at the same time, for commercial or other reasons (consider the examples of Ocean Protocol on page 9 and MELLODDY on page 7).



HPE's Swarm Learning Library, a decentralized AI solution, is enabling hospitals or networks of hospitals to safely share sensitive biological data all over the world – in full compliance with privacy laws – in order to train reliable ML models for fast and reliable detection of severe illnesses.⁴⁰ Individual nodes train ML models on their own data, then share the resulting parameters (but not the data itself) with each other to collaboratively train the central model. Unlike many other federated learning models, it does not need a central parameter server as the merging of parameters is done by a dynamically elected leader among the members. The Swarm Learning Library is already helping to identify leukaemia and acute tuberculosis patients.

Distributed Insight Generation

Like decentralized learning, distributed insight generation accesses and analyses data spread across multiple locations. It relies on moving code and sharing the algorithm that extracts insights from various data sets, rather than moving the data.



The Open Algorithm (OPAL) project is an open and secure platform, with accompanying algorithms, that crunches data on the servers of partner companies behind their firewalls to extract key insights and unlock private sector data for the public good.⁴¹ It works by sending code to the underlying data in a privacy-preserving and scalable manner.⁴² Among other use cases, OPAL is deriving key indicators (such as population density, poverty levels and mobility patterns) from telecommunications operators to support development projects.

Multi-Party Computation (MPC)

MPC is a cryptographic protocol that enables joint computation on distributed data without exposing or moving it. Collaborators can combine data for mutually beneficial insights and outcomes without revealing any sensitive information.



Sedicii developed a collaborative anti-money laundering monitoring platform that uses MPC. It enables a network of two or more banks to jointly and confidentially compute a risk assessment algorithm that consumes information from participating entities without actually sharing or exposing customer data. Financial institutions can thus pre-screen, in real time, securely and privately, all parties to a transaction for many types of common fraud.⁴³

Differential Privacy

Differential privacy adds “noise” or randomness to data or computations, hiding the specifics and protecting privacy rights while still allowing companies to gather and infer generalizable statistical information. Companies see enough information to tailor products and services or to train ML algorithms but users’ privacy is preserved. This approach enables data to be shared, analysed and monetized among multiple enterprises and jurisdictions, meeting even the strictest privacy regulations. It is maturing for serious deployment, with emerging industry activity.⁴⁴



Apple, Uber, Facebook and Google are all implementing differential privacy in various areas. Facebook’s Data for Good project, for example, uses

differential privacy techniques to aggregate location data and share it with academia, governments and humanitarian organizations to support response efforts to COVID-19 and natural disasters.⁴⁵ ⁴⁶ Google has used differential privacy in its reports that visualize aggregate population movement patterns to analyse social distancing efforts.⁴⁷ Google has also launched an open-source differential privacy library to aid small businesses, developers and urban planners.⁴⁸

Homomorphic Encryption

Homomorphic encryption encrypts data not for communications between two parties but to allow computations to be run on it while encoded. This allows companies to utilize third-party computational resources such as cloud-based AI, high-performance or quantum computing without concerns about revealing sensitive information. Third parties can not only transport data securely but also process, enrich or change the data in an encrypted state. This allows for sharing of computational capabilities and joint analysis without ever exposing the underlying data.



Duality Technologies, together with the Dana-Farber Cancer Institute and Harvard Medical School, has used homomorphic encryption to perform large-scale Genome-Wide Association Studies on encrypted genetic data from over 25,000 individuals, producing results 30 times faster than alternative privacy-preserving methods. By removing barriers to sharing and analysing sensitive genomic medical data, which is subject to stringent privacy protections, this solution can also support the analysis of other complex diseases, the response to COVID-19 and the development of personalized medicine.⁴⁹

Personal Online Data Stores (Pods)

Pods allow individuals to store personal data from multiple sources while retaining control. Rather than uploading isolated sets of data to isolated companies for different services, users grant permission for companies to access the rich data that lives on their Pods.⁵⁰ Pods are portable and the user can choose where to store data, whether at home or with an external provider (consider the example of Inrupt on page 7).



The need for information sharing and collaboration on sensitive data is rapidly rising in all regulated industries as data grows exponentially and data privacy regulation expands globally. Privacy Enhancing Technologies (PETs) are maturing and becoming essential, enabling new business models while keeping the data value chain compliant with heterogenous privacy legislations.

Rina Shainski, Chairwoman and Co-Founder, Duality Technologies

Data Sharding

Data sharding is a database architecture that breaks up data so it resides in “shards” that are distributed across separate database nodes. The shards are autonomous and unique – they do not share data or computing resources – but together they represent a logical data set. Data sharding allows organizations to seamlessly scale their database beyond the hardware limits of a single server without adding complexity to their growing applications while enabling collaborators to work more easily with distributed data.



MongoDB, a modern, general-purpose, database platform, uses data sharding to offer businesses built-in scaling for flexible transactional, operational and analytical use cases: e-commerce, IoT and mobile applications, among others.⁵¹ It enables businesses to build distributed databases that support geographically dispersed applications, with policies enforcing data residence for specific regions.⁵²

Digital Twin

A digital twin is a virtual model of a process, product or service, based wholly or partly on data from the physical world. Business uses for digital twins include superior insights, enhanced collaboration, more accurate forecasts and scenario modelling. The mobility industry, for example, is using digital twins of manufacturing value chains to optimize production and create new products. Healthcare companies are creating digital twins of the human heart to facilitate diagnosis and education. Singapore is using a virtual replica of itself for smart city planning (also consider the example of Dassault Systèmes on page 8).⁵³



MDClone and Jefferson Health

partnered to use synthetic data to enable collaborative, global and real-time clinical exploration.⁵⁴

MDClone’s synthetic data engine democratizes data across the healthcare ecosystem, creating a fictitious set of subjects based on statistical properties extracted from a real group of people but without any one-to-one connection. This enables an ecosystem of business partners to access big data to drive healthcare innovation, spanning research, validation of algorithms and development of new services, without compromising patient privacy and confidentiality. MDClone is also involved in other collaborations tackling the COVID-19 pandemic and preparing for future health crises.^{55 56}

Explainable and Robust AI

Companies in every sector are increasingly reliant on AI for decision-making, yet some AI systems have demonstrated bias against women and people of colour, among other demographics.^{57 58} This can cause serious harm, including false arrests due to racially biased AI in facial-recognition systems.⁵⁹ Transparent, explainable and robust AI can reduce these risks and foster societal trust.



Fiddler Labs has created an AI engine that makes decision factors visible, so developers, regulators, businesses and end users can better understand how

models work and course-correct as needed.⁶⁰ Many organizations, such as Immuta, Truepic and the Better Ethics and Consumer Outcomes Network (BEACON), are also tackling the broader problem of data veracity.



In the wake of the coronavirus pandemic, technology will continue to accelerate our ability to gain and use data. Our job is to make business and operating model choices that deliver value from data to all stakeholders – in a trustworthy and responsible way.

Stephen Klasko, MD/MBA, Chief Executive Officer, Jefferson Health; President, Thomas Jefferson University; Fellow, World Economic Forum



We are at a unique moment – new capabilities enable us to create insight and value from data while protecting the interests of all involved. Now it is up to businesses to pivot their mindset and models towards this new paradigm.

Francisco D'Souza, Co-Founder, Cognizant; Fellow, World Economic Forum

3.2 Non-Technology Enablers

Technology by itself is not enough. New technical and data standards and protocols (especially in the United States and Asia), open-source, data-sharing agreements and contracts are emerging to unlock more value from data. Industries and governments are working together to promote human-centred innovation and a more distributed internet. A few examples follow:

- **Financial Industry Business Ontology (FIBO)** is a business conceptual model and standard to harmonize data across repositories for the financial industry. It allows for data quality validation, business process automation and flexible risk analysis.⁶¹
- **The Digital Twin Consortium**, launched by the non-profit trade association Object Management Group (OMG) whose members include Ansys, Dell Technologies, Lendlease and Microsoft, is a cross-industry collaboration to drive standardization in nomenclature, architecture, security and interoperability for digital twin products and services.⁶²
- **Japan's Ministry of Economy, Trade and Industry (METI)** has published data contract guidelines and security manuals to help companies exchange industrial data. METI is aiming to advance "connected industries",

create new value and tackle societal problems by connecting machines, technologies and people via data. By following METI's template contracts, business can feel confident that they will be fully compliant and able to exchange data safely and productively.⁶³

- **The Linux Foundation's Confidential Computing Consortium**, which includes Intel, Google and Microsoft, promotes the use of confidential computing, open-source data and better data security.⁶⁴
- **The China Institute of Information and Communication and China Mobile** have launched a working group to develop industry standards for secure computing based on a TEE. Participants include Ant Financial, Huawei, China Telecom, Baidu and Tencent.⁶⁵
- **The Singapore government's Business sans Borders (BSB)** is a hybrid data and solutions hub for small and medium-sized enterprises (SMEs). BSB helps SMEs access a global ecosystem of buyers, sellers and providers, with AI helping these SMEs discover prices and sales opportunities, access supply chains, and source for and use digital and financial solutions.⁶⁶



Creating resilient economies. Preventing future pandemics. Healing our environment. The key to solving society's toughest challenges lies in our ability to extract and share knowledge and insights from our data. The next era of digital transformation must be about driving new discoveries from our data that benefit all and that enable us to collectively accomplish more than what's ever been possible.

Antonio Neri, President & Chief Executive Officer, Hewlett Packard Enterprise

4

Conclusion – A New Paradigm for Business

For companies large and small, all around the world, their future depends on using data effectively. Effective data use means using it within an enterprise not only to drive shareholder value but also to build new forms of collaboration, based on new technologies and non-technology approaches, that create value for all stakeholders.

4.1 Stakeholder Empowerment



of CEOs believe the crisis will accelerate stakeholder capitalism⁶⁷

For all data-driven value, trust is a foundational element in enabling businesses to build deep, sustainable relationships. Trust requires understanding how different stakeholders experience value and how this experience evolves over time, then making an authentic commitment to delivering that value on stakeholders’ terms.

This is especially relevant for individuals today. An individual may be entirely comfortable with sharing data to help tackle COVID-19, whether to facilitate tracking and tracing, enable diagnostic analysis or advance the quest for a vaccine. While in other contexts, such as recent anti-racism protests, the same individual many feel resistant to surveillance due to concerns about infringement of rights.

To build trusted relationships with stakeholders, companies need to understand their partners’ core needs, the regulatory requirements and public safety responsibilities of governments and the increased privacy concerns and market needs for individual agency. It also requires an understanding of how to operationalize the interests of these different stakeholders into their business and operational models. New technologies offer companies new choices to enable deep protection of data while it is being handled, to “move” algorithms or insights rather than data, and the other capabilities illustrated above.



Society is at a tipping point and technology has come to the forefront in a way not imagined only a few months ago. This creates expectations of increased inclusion and lessened inequalities. Data-reliant services and products are key to progress, and stakeholder engagement and transparency will be key to increasing trust.

Lynn St. Amour, President and Chief Executive Officer, Internet Matters;
Member, Digital Economy Stewardship Board, World Economic Forum

4.1 Collaborative Ecosystems and Partnerships



of executives say that innovation will require new ways of collaborating with ecosystem partners and third-party organizations⁶⁸



Today, collectors of data benefit much more from the data than the ones who provide it. We need to change this going forward. Business model innovation and industry collaboration are crucial for enabling equitable value creation from data – for businesses, data providers and society.

Gisbert Rühl, Chief Executive Officer, Klöckner & Co.

Several examples in the previous pages display a collaborative approach to generating value from data. UP42 or BBVA, for example, provide open platforms for their ecosystems. MELLODDY brings together 10 competitors. Many such collaborations are open and dynamic, so multiple ecosystem members can identify their new opportunities and market needs based

on their unique position and core strengths. Many companies are discovering that partners, customers or suppliers have adjacent data and insights that, if combined with care through ecosystems and platforms, can create richer value propositions for all.

4.2 Sustainable Value Creation and Systems Change

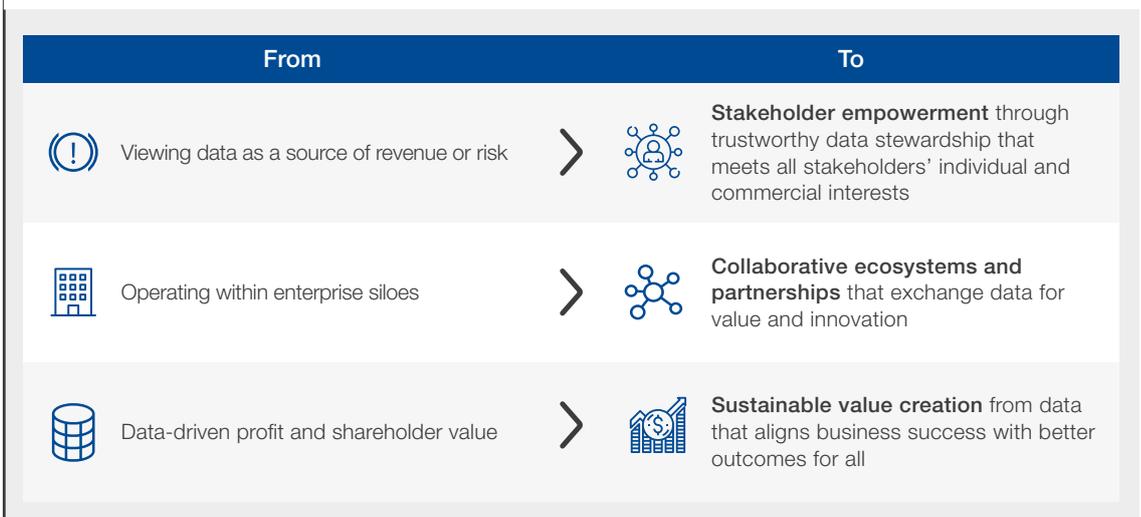
New commercial collaborations are allowing companies to target customer needs and shared success, while granting individuals agency over their data creates market dynamics that favour trustworthy businesses and positive outcomes for people.

The result of these new opportunities and incentives is a paradigm shift; companies can operationalize responsible intent while developing attractive, sustainable new revenue streams. Since these new collaborations and partnerships are not constrained by traditional industry value chains, these cross-sectoral

partnerships are eroding traditional value pools and shaping the industries of tomorrow.

This new paradigm, based on collaborative ecosystems, trustworthy data stewardship and aligning business success with better outcomes for all, is already emerging. It is our hope that this paper, by exploring some of the actions that leading businesses are already taking, will advance and refine this paradigm, on which the future of capitalism and the sustainability of our planet may depend.

FIGURE 2 New paradigm for business of data



Source:
World Economic Forum

Further Reading

For broader business perspectives on digital transformation to create new sustainable and inclusive value:

- [Digital Transformation Initiative](#)
- [Digital Transformation: Powering the Great Reset](#)

For perspectives on operationalizing data intent in specific sectors – please see the following industry-specific guides:

- Manufacturing – [Share to Gain: Unlocking Data Value in Manufacturing](#)
- Financial Services – [The Next Generation of Data-Sharing in Financial Services: Using Privacy Enhancing Techniques to Unlock New Value](#)
- Health – [Global Data Access for Solving Rare Disease A Health Economics Value Framework](#)
- Health – [Federated Data Systems: Balancing Innovation and Trust in the Use of Sensitive Data](#)
- Mobility – [10 Principles of Mobility Data Operationalization](#)

For guiding principles to establish public-private partnerships:

- [Data Collaboration for the Common Good Enabling Trust and Innovation Through Public-Private Partnerships](#)

For perspectives on enabling smooth flows of data across borders:

- [Data Free Flow with Trust \(DFFT\): Paths towards Free and Trusted Data Flows](#)
- [A Roadmap for Cross-Border Data Flows: Future-Proofing Readiness and Cooperation in the New Data Economy](#)

For design frameworks to operationalize empowerment of end users through good digital identity:

- [Reimagining Digital Identity: A Strategic Imperative](#)

For use cases that leverage data and technology for COVID-19 response:

- [Critical Frontier: Leveraging Technology to Combat COVID 19](#)

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7

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