# The Hyperconnected Digital Fabric: Multiplying Value Creation Within Digital Enterprises and Their Ecosystems

To inoculate against rapid change, recessionary headwinds, and competitive pressures, organizations must learn to harness data in motion and unlock the latent value of ecosystems.

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## EXECUTIVE SUMMARY

By 2027, organizations with established industry value chains on an ecosystem control plane will innovate 25% faster than those that do not have them.

### Key Stats

■ 89% of API CEOs see active participation in the digital ecosystem as vital for revenue growth.

■ 64% of organizations led by CEOs championing digital-first strategies consider ecosystem contribution the top business metric to guide their transformation.

### Key Takeaways

■ The digital fabric is the technology foundation for digital businesses to unlock value within their ecosystems using shared data, applications, and operations.

■ Harnessing data in motion from the digital fabric improves value chain efficiencies and enables ecosystem-based business models to counter rapid changes in the marketplace.

## Digital Business and The New Anatomy of Value

Asia/Pacific is undergoing a new phase of digital transformation, with organizations using digital technology to compete in today's fast-paced landscape. By 2027, Asia/Pacific CEOs expect to increase their digital revenue share to an average of 43%, up from 26% in 2022. After the pandemic, organizations unanimously recognize the value of digital technologies in business. IDC's research shows that between 2021 and 2022, organizations achieved business improvements of 20% to 29% in revenue, profits, and cost savings due to their digital investments. As such, IDC's Future Enterprise Resiliency and Spending Survey in January 2023 shows that 87% of organizations have adopted digital-first strategies and are in various stages of transformation to become digital businesses.

At the same time, business and technology leaders face rising levels of uncertainty, complexity, and ambiguity. There are various externalities that organizations must adapt to, including changes in environmental regulations, inflationary pressures, disruptions in supply chains, cybersecurity threats, health/pandemic concerns, talent skill gaps, and geopolitical risks, among others. Against these forces, IDC's C-Suite Survey 2022 shows that operational efficiency, cost reduction, and profitability are top of mind for Asia/Pacific business and technology leaders.

We have now entered the era of digital business. In the prior period, the incremental transformation was about scaling digital technology within the enterprise. In this era, organizations use technology to compete through digital products, services, and experiences. To do so, new digital capabilities must be built to enable real-time collaboration, provide predictive augmentation, and orchestrate distributed activities. The convergence of digital platforms, cloud computing, the Internet of Things (IoT), 5G connectivity, and artificial intelligence (AI) is reconfiguring businesses, operations, and teams into digital-first ones.

Our research shows that one critical lever is for enterprises to participate in digital ecosystems and unlock efficiency improvements and innovation opportunities.
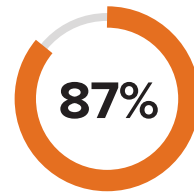
**87%**

**87% of organizations have adopted digital-first strategies and are in various stages of transformation to become digital businesses.**

Source: IDC Future Enterprise Resiliency and Spending Survey, January 2023

## Organizations must participate in digital ecosystems to create digital value while inoculating against negative change.

By leveraging digital technology and real-time insights, it is possible to eliminate long-standing frictions, such as the bullwhip effect in supply chains, for efficiency gains.

This report provides a perspective on value creation in a hyperconnected world and recommends actions organizations must take to unlock cross-organizational synergies in this new era.

## The Digital Fabric: Backbone and Foundation

As part of this transformation, organizations must develop their digital fabrics. Digital fabrics are the intersection of interconnected network devices, systems, and platforms that serve as the foundation for digital businesses and their external ecosystems. They enable seamless communication and collaboration between distributed people, processes, applications, and devices for sharing data, applications, and operations inside and outside corporate boundaries.

One aspect of how digital fabrics fundamentally differ from past communications and computing networks is through **data in motion** (*see Figure 1*). Data in motion is real-time data transmitted within the digital fabric essential for coordinating value stream activities across distributed systems, edges, and locations. Compared to static and siloed data, data in motion enables high volume, real-time, and distributed processing of structured and unstructured data. This includes streaming data from IoT devices for always-on ecosystem sensing, coordination, and collaboration.

**Organizations must develop their digital fabrics – the intersection of interconnected network devices, systems, and platforms.**

**FIGURE 1**

**Connecting People, Processes, Applications, and Things with Data in Motion**
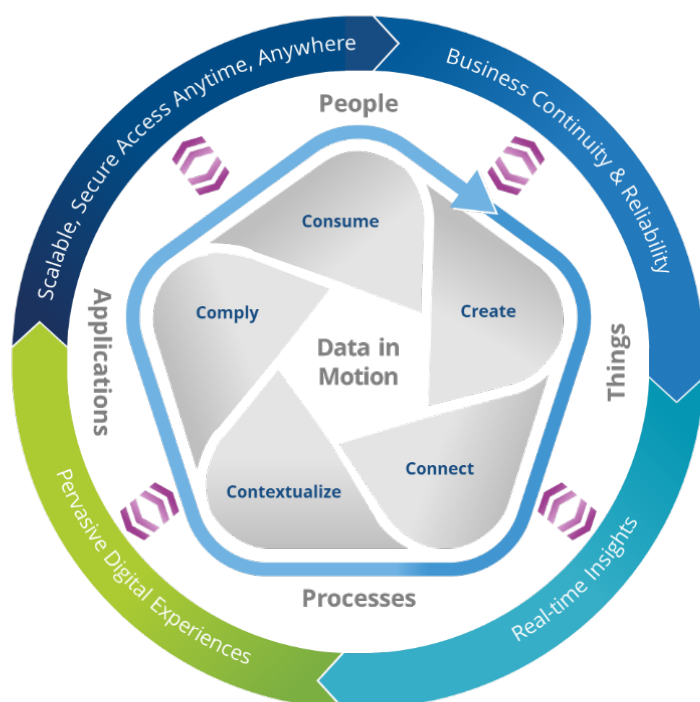


Source: The Future of Connectedness, IDC

Data in motion enables joint value creation through **anytime and anywhere access** to applications and services; **pervasive digital experiences** for customers, employees, and partners; **real-time insights** and information; and **business continuity and reliability** for mission-critical processes and transactions.

Data in motion is game-changing for most organizations, and requires new digital capabilities that are prerequisites to unlocking the potential of digital ecosystems' symbiotic relationships.

**By developing digital fabric capabilities and measuring progress with relevant performance metrics, organizations can unlock the potential of their digital businesses and digital ecosystems to enable value creation.**

## Developing the Hyperconnected Digital Fabric for Value Creation

Organizations must develop and connect to digital fabrics by adopting a technology strategy to leverage network infrastructure, platforms, tools, and interfaces to create, connect, consume, and contextualize data while ensuring compliance. By developing digital fabric capabilities and measuring progress with relevant performance metrics (*see Table 1*), organizations can unlock the potential of their digital businesses and digital ecosystems to enable value creation:

▶ **Anytime and anywhere access to applications and services.** The digital infrastructure must provide secure computing that can be done anywhere and provide seamless and flexible enterprise-wide connectivity to shared data, applications, and operations through any time and anywhere access. Cyber-risk management is crucial to ensure trusted and secure enterprise and ecosystem access.

▶ **Pervasive digital experiences for customers, employees, and partners.** IT products and services must deliver superior customer and user experiences through personalized and intelligent interactions. In the workplace, agile machine-human workspaces automate IT operations and enhance employee workflows, culture, and experiences. Externally, IT services are designed to meet ecosystem constituents' needs and opportunities, focused on being instrumented, customizable, and business-focused.

**TABLE 1**

## Sample KPIs for Developing the Hyperconnected Digital Fabric

| Digital Fabric Dimensions | | Business KPIs | Operational KPIs |
|---|---|---|---|
| **Anytime and anywhere access** | **Ubiquitous processing** | • Increase in customer and employee satisfaction.<br>• Increase in speed and volume of ecosystem coverage of business outcome achievement. | • Increased digital twins' accuracy makes real-time simulations possible for business outcome trade-off analysis.<br>• Increase in decision-making speed, either automated or human-driven. |
| | **Ubiquitous connectivity** | • Improvement in customer and employee engagement.<br>• Increased availability of data relevant to business outcomes. | • Increased system availability due to peak-load process reassignments.<br>• Increased speed in process execution. |
| | **Cyber risk management** | • Brand and reputation.<br>• Confidentiality of customer, partner and company data. | • Number of devices connected to enterprise in real time (internal/external, known/unknown, certified/uncertified).<br>• Depth, breadth, or currency of risk register in which all significant risks are recorded. |
| **Pervasive digital experiences** | **Digital-first customer/user experience** | • Increased customer satisfaction with service delivery channels.<br>• Sales gain due to predictive recommendations available during and/or before customer calls. | • Decreased cost to sell and service.<br>• Insights on user interactions (call drop off, journey time to task completion, page views, and duration). |
| | **Agile machine-human workspaces** | • Employee satisfaction with technology and workspace.<br>• Reduction in labor costs due to the use of AI and automation. | • Increased productivity driven by workflow augmentation.<br>• Results of employee engagement surveys. |
| | **Ecosystem-focused services** | • Speed to deploy new capabilities.<br>• Satisfaction by partners. | • Rate of connected business processes migrated to an "as a service" cloud platform.<br>• Rate of IT deployments that extend to edge locations. |
| **Real-time insights** | **Pervasive intelligence** | • State of the enterprise data model and data accessibility.<br>• Adoption of AI capabilities in vision, language, reasoning, and execution to support business processes. | • Increase in usage of data catalogues and analytics dashboards.<br>• Number of insights resulting in process redesign. |
| | **Automation** | • Quality improvement.<br>• The pervasiveness of automation. | • Decreased operational downtime due to autonomous corrective actions.<br>• Process time savings/labor hour savings. |
| | **App and data management** | • Labor saved through automated integration of data and enhanced confidence in data completeness and compliance.<br>• Amount of storage saved through creation of an enterprise data model which consolidates and recognizes systems of record. | • Growth in insights sources and distribution through third-party applications and data sources.<br>• Increase in data use cases that show the impact of application intake, integration, and input on decision-making. |
| **Business continuity and reliability** | **Consistent automated control planes** | • Reduction of technical debt due to an increase in accurate asset aging and end-of-life monitoring.<br>• Enhanced geographic monitoring of extended supply chain for potential risk. | • Improvement of speed in redirecting peak processing.<br>• Improved staff/system ratios as autonomous control grow.<br>• Increase in proactive problem resolution. |
| | **Digital resilience** | • Growth in new geographies or lines of business.<br>• Market share, overall, and growth from new products/services. | • Level of effort to pivot – reengineer existing service or product to a new business model, geography, or customer set.<br>• Number of cybersecurity threats proactively detected and responded to. |

Source: IDC Measuring Future IT (KPIs for Digital Infrastructure / IT Products and Services / Trusted and Secured Enterprise / Innovation and Intelligence.

▶ **Real-time insights.** Pervasive intelligence drives innovation and informed decision-making. The digital infrastructure enables advanced analysis and predictive capabilities utilizing real-time and in-motion data. Dynamic data management and insight distribution are crucial for ongoing decision-making, app consumption, and automation.

▶ **Business continuity and reliability.** The focus shifts to enabling new business and operating models. The digital infrastructure prioritizes business continuity and reliability by implementing a unified and agnostic systems management approach across heterogeneous infrastructure, sites, and locations. The self-regulating control planes ensure consistency across the hybrid cloud, IT portfolios, and ecosystems. IT products and services are designed with digital resiliency in mind, promoting business agility in enabling business pivots and/or new digital products and services through infrastructure design.

> **Interoperable and open platforms enable participants with no prior relationships to join the ecosystem and collaborate through shared operations, applications, and data.**

## Digital Ecosystems: Unlocking the Value of Symbiotic Relations

Digital fabrics are increasingly important to businesses for unlocking value creation outside of the corporate boundaries. Digital ecosystems are connected networks of interdependent entities, including organizations, users, processes, and devices, that interact with one another to create, deliver, and consume digital products and services. In Asia/Pacific, according to IDC's research, 64% of organizations led by CEOs who champion digital-first strategies consider ecosystem contribution as the top business metric to track in guiding their organizations' transformation.

Compared to traditional business ecosystems, digital ecosystems multiply the benefits of symbiotic relationships to accelerate growth and innovation. Interoperable and open platforms enable participants with no prior relationships to join the ecosystem and collaborate through shared operations, applications, and data. Our research shows that collaboration can result in increased productivity, efficiency, and innovation. Digital ecosystems fueled by the power of shared data can ideate, operate, and adapt more responsively in a dynamic environment. IDC predicts that by 2027, organizations with established industry value chains on an ecosystem control plane will innovate 25% faster than those that do not have them.

**5%**

**By the end of 2023, organizations that share data, applications, or operations with their ecosystem partners through joint ventures will increase profitability by 5 percentage points.**

Source: IDC FutureScape: Worldwide Future of Industry Ecosystems 2023 Predictions

**FIGURE 2**

## Mine-to-Port Operations of Hunter Valley Coal Chain Ecosystem
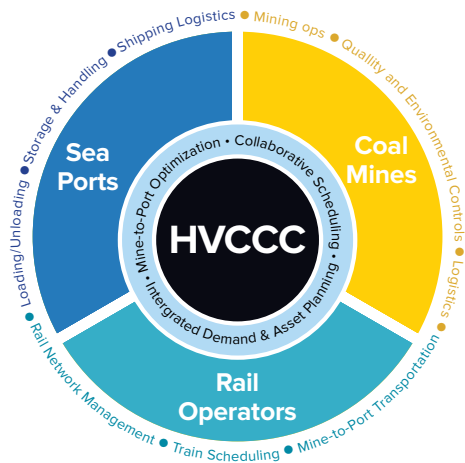


Source: Hunter Valley Coal Chain Coordinator and IDC, 2023

One example of a leading digital ecosystem is Australia's Hunter Valley Coal Coordinator (HVCCC). The organization is responsible for the effective and safe movement of coals across an ecosystem comprising more than 40 active mines and six rail and seaport operators. In scale, the ecosystem's geographic coverage spans an area of around 24,000 square kilometers, equivalent to six times the size of Paris. According to IDC interviews, HVCCC developed HVCCC Insight to improve the coal chain's efficiency by using shared data to coordinate mine-to-port operations across its member organizations. The program uses advanced analytics and data modeling to optimize the coal chain by identifying bottlenecks in rail and freight schedules, improving capacity planning across member organizations, and ensuring smooth coal transport and safe handling from mine to port (*see Figure 2*).

The benefits of a digital ecosystem extend beyond efficiency. They also have the potential to reconfigure value chains and traditional industrial boundaries, enabling innovation and growth opportunities. Such cross-industry ecosystems have enabled new business models with tremendous growth, pointing to the synergistic benefits that digital ecosystems can unlock. An example is Alibaba's New Retail, an online and offline retail ecosystem comprising integrated payment and financial services and owned and third-party logistics. IDC believes the next wave of the technology revolution will see reshaped industrial lines due to inter-industry collaborations.

IDC research shows that most CEOs in Asia/Pacific agree, with 89% seeing active participation in the digital ecosystem as vital for revenue growth. Organizations must build collaborative networks to benefit from joint value creation where growth and innovation are fueled by optimizing resources and leveraging non-organic assets, expertise, and data. As organizations transform into digital businesses, participation in digital ecosystems and developing hyperconnected capabilities are integral to unlocking the potential of that transformation.

Within this hyperconnected environment, each independent entity is enabled to maximize value creation and capture (*see Table 2*).

**89%**

**Active participation in digital ecosystems is seen as vital for revenue growth, according to 89% of CEOs in Asia/Pacific.**

Source: IDC CEO Sentiment Survey 2022

**TABLE 2**

## Examples of Value Creation through Digital Ecosystems

|  | **Manufacturing** | **Oil & Gas** | **Retail** |
|---|---|---|---|
| **Ecosystem participants** | • Consumers of home appliances (customers).<br>• Domestic and overseas sales subsidiaries.<br>• Third-party customer support service providers.<br>• Logistics providers. | • Mines.<br>• Processing and refining plants.<br>• Distributors/retailers and industrial customers.<br>• Energy security and environment agencies. | • Consumers.<br>• Third-party merchants.<br>• Suppliers.<br>• Logistics providers.<br>• Financial services providers. |
| **Shared data and insights** | • Improved order forecasting accuracy using an end-to-end supply chain control tower with automated stock replenishment, production scheduling, logistics path planning, and warehousing design. | • Improved operational efficiency by creating digital twins of assets and operations (including suppliers, transporters, and distributors) to provide real-time visibility into product movements and delivery schedules. | • Improved customer experience by sharing purchasing behavior and consumer preferences to personalize shopping experiences and drive targeted marketing. |
| **Shared applications** | • Improved on-time delivery rate and minimized delivery risk using machine learning (ML)-based predictions and shared mobile app to proactively resolve delays. | • Enhanced regulatory compliance through digital twin applications which provide a comprehensive and accurate representation of operations for compliance with government agencies. | • Increased sales and secured payment options through shared shopping and payment platforms. |
| **Shared operations** | • Enhanced accurate and fast servicing with real-time monitoring of home appliances using IoT to report abnormalities to consumers and service support providers in real time. | • Improved mining outputs through the sharing of seismic activity data, drilling results to affect production. | • Improved operational efficiency for merchants and suppliers through streamlined logistics and delivery services comprising both owned and non-organic delivery assets. |

Source: IDC Future Enterprise Awards 2022 and IDC Research.

## The Hyperconnected Digital Fabric Is Essential for Constant Adaption

In today's rapidly changing and hyper landscape, enterprises must go beyond digital transformation initiatives to become digital business to compete successfully. For organizations to thrive as digital businesses, they must be agile and resilient by tapping into the symbiotic relationships of their ecosystems — creating and capturing value by being informed and enabled by their ecosystems while contributing value to the same through their own data and operations.

The hyperconnected digital fabric is the foundation of the digital-first economy, and data in motion is essential to the effective creation, consumption and contextualization of corporate and ecosystem data, applications, and operations. Organizations must develop the capabilities for anytime and anywhere access, pervasive digital experiences, real-time insights, and business continuity and reliability. By doing so, a digital business can excel in value creation for improved efficiency, new innovation, and greater agility; enabling the business to adapt continuously.

# About the IDC Analysts

## Lawrence Cheok
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Lawrence is an Associate Research Director for IDC's Asia/Pacific Digital Business Strategies research program. Based in Singapore, Lawrence provides advisory services to technology buyers and suppliers in this role, leveraging primary and secondary research to uncover emerging business and technology trends, the competitive landscape, and buyer adoption.

**More about Lawrence Cheok**

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Linus heads Asia/Pacific research in Digital Business Strategies, Digital Trust, Software, and IT Services Research, with more than 20 years of technology advisory experience in the region. Based in Sydney, Australia, he has experience in several cloud, software, and services programs in Asia/Pacific excluding Japan (APEJ), which covers a wide range of technology and services markets across 13 countries.

**More about Linus Lai**

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