

CASE STUDY

CATALYST: REDEFINING SUPPLY CHAINS

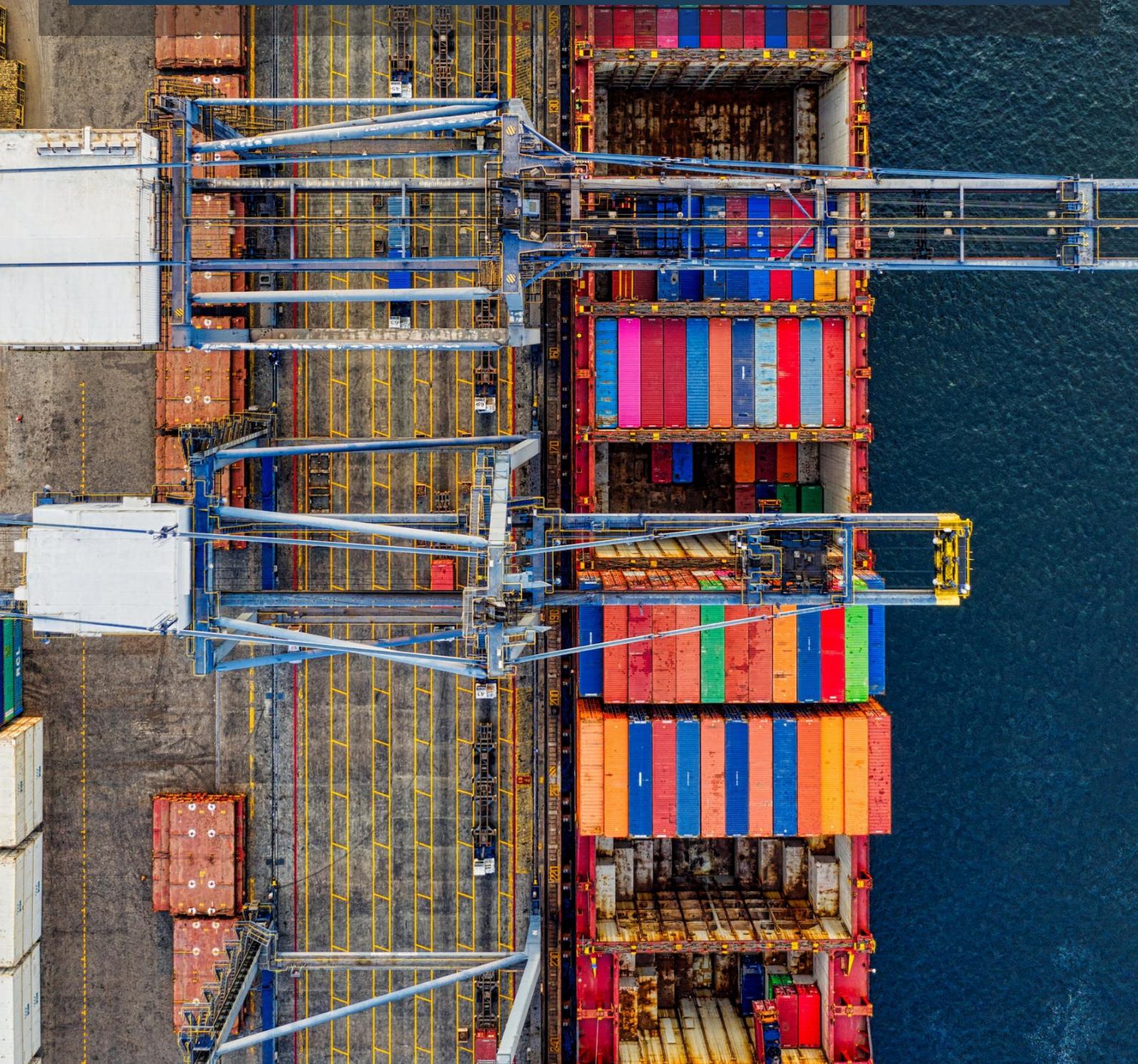


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Blockchain: The Vaccine Against Global Disruption?

Since the start of the outbreak, supply chains around the world have been challenged by factory shutdowns, demand surges and consumer stockpiling and panic-buying.

COVID19 has tested the level of resilience for global value chains and the overall approach to manufacturing and production. The COVID19 crisis continues to disrupt industries and global supply chains with major implications for society, businesses, consumers, and the globalised economy.

Facing up to these disruptions requires new forms of collaboration across companies and industries to ensure business continuity while protecting employees and improving supply systems resilience for the future.

Global value chains have traditionally been optimised for ‘cost-competitiveness’ reasons, and the COVID-19 pandemic proves that companies need to reorient towards new approaches, which are prone to ‘risk competitiveness’.

Leading multinational companies have already launched strategic initiatives to create more resilient supply chains before the on-going crisis and are now seeing an acceleration of the speed and determination of implementation.¹

fig. 1. Key imperatives for global value chains



Rapid tailoring of manufacturing and supply systems to changing customer behaviour



Agile manufacturing and supply system set-ups enabled by advanced technology



Logistics coordination across and within global value chains



Adoption of new ways of working and governing to increase manufacturing resilience



Shared responsibility and collaboration among companies and authorities to address social and environmental challenges

How Are Supply Chains Continuing to Operate?

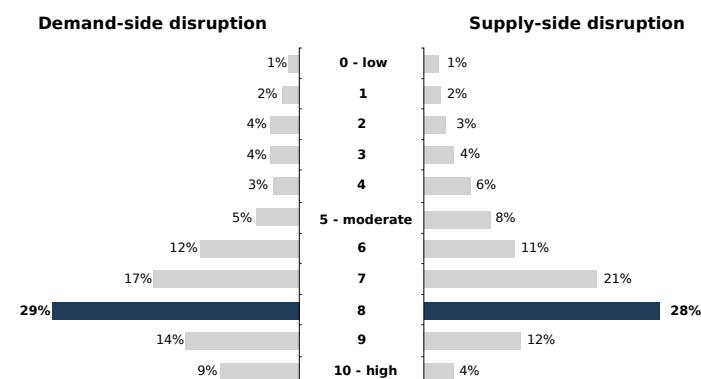


fig. 2. How is COVID19 affecting organisations on the demand & supply side

According to the recent white paper produced by the World Economic Forum, businesses have established cross-functional control towers to coordinate responses to COVID19 on a global and regional level – Increased safety stocks and shift inventories between sites when needed. Other measures to ensure business continuity include;

- Proactively manage costs and cash to ensure liquidity
- Pivot freight models (e.g. from sea to air freight) to deal with potential bottlenecks
- Offer customer support programmes to keep customers up to date and provide remote customer support
- Prepare for a rebound when demand returns, as markets will most likely be overwhelmed

- Quickly react and adopt to new/changing sources of demand to meet customer preferences and secure revenue streams

Many businesses attributed their ability to quickly react to the crisis to recent investments in digitisation across their supply chains, especially investments which enable real-time availability of data/information.

Underlying the stresses felt by industry are the core technology platforms which they rely. Increasing visibility, improving risk assessments and increasing flexibility to a changing demand were consistently ranked as top three priorities coming out of the crisis.

Business Processes & Supply Chain Management

Broadly speaking Blockchain technology offers greater transparency and a single source of truth for participants using supply chain networks. Greater transparency about food produce such as location and quality gives supply chain managers more control as it allows them to operate more effectively with the use of intelligent track and trace capabilities.

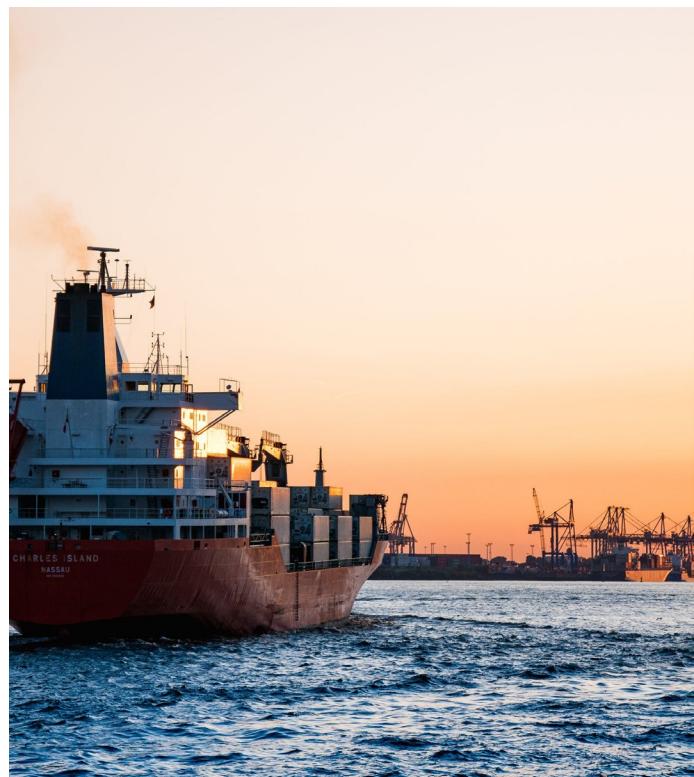
At Red Skies, we designed Catalyst to support the core functionality needed to make businesses run more effectively. Specific to supply chain networks, Catalyst provides the following benefits;

Digitisation - Most non-integrated supply-chains still rely on insecure and inefficient physical paper-based processes. By using Catalyst, stakeholders digitise physical processes with smart contracts and integrated distributed file system to enhance productivity.

Authenticity - Food producers, manufactures, retailers and customers all face difficulties in verifying a product's authenticity. With Blockchain, products may be linked with non-fungible tokens at the moment of creation. These tokens may then be used as digital certificates.

Transparency - Customers expect to have transparent information about products' raw materials and manufacturing processes. On Catalyst, each stakeholder across the supply chain can provide verified information.

Verification - Consumers are increasingly conscious of the origin of the produce that they purchase for a myriad of reasons, such as environmental concerns, ethical reasons and sustainable goals. With Catalyst, customers can collect and manage unique tokens associated with physical products, and use these tokens to prove product authenticity and ownership.



Catalyst can digitise, secure, and ultimately accelerate operational processes and supply chains across markets. Moving away from paper-based processes towards digitally verifiable and legally enforceable documentation means more rapid industry operations and reduction in counterfeits and fraud.

At Red Skies we have built Catalyst to streamline manual processes, with an integrated distributed file system businesses can rely on to securely send critical documentation related to the transport for freight goods and invoices.

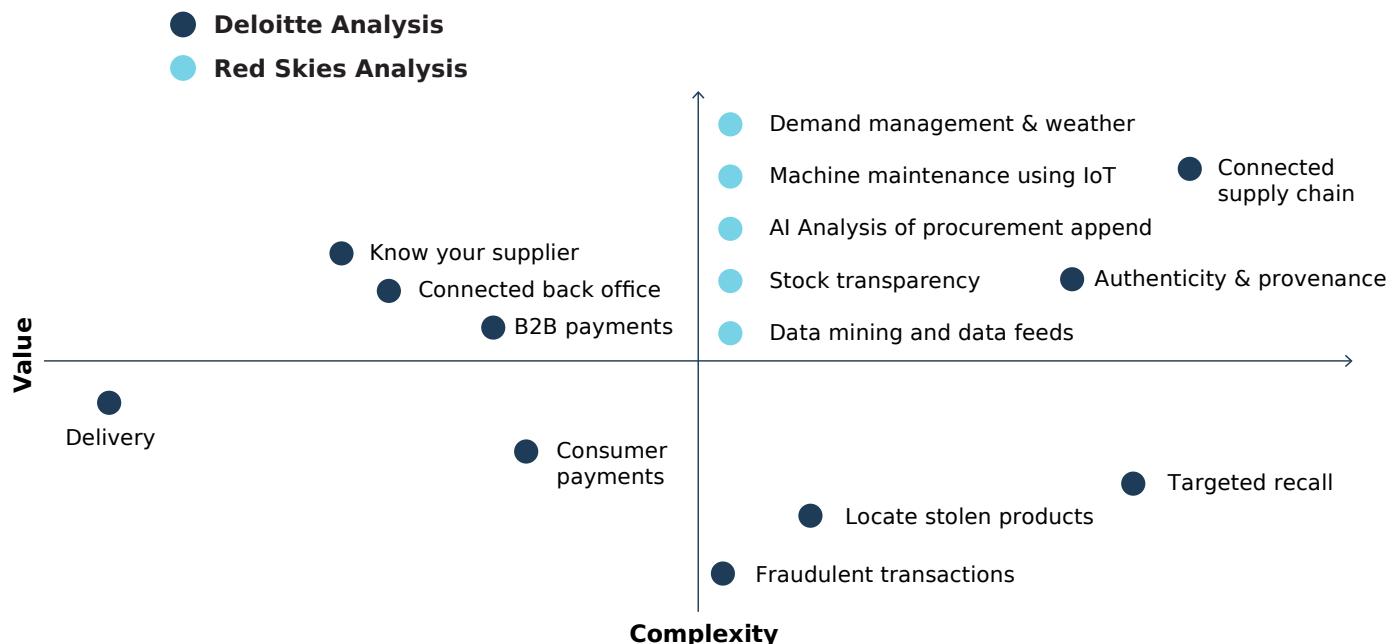


fig. 5. Leading soft drink supply chain priorities, value and complexity matrix

Over the past century, the food production industry has followed the modern trend of increasing globalisation. Recent scandals demonstrate at best that some producers are ignorant of the provenance of their product and, at worst, actively attempting to subvert the trust of the consumer. This leaves consumers relying on blind faith in the packaging and marketing of the produce.

By using Catalyst, producers can authenticate their produce and consumers can validate the claims on packaging or labels.

Our products and services help businesses easily launch blockchain-based solutions that have an immediate business impact through;

Automation Streamline business processes through programmable transactions and real-time clearing and settlement.

Trust Manage a platform at scale with zero downtime. Private instances of Catalyst run in the cloud with nodes hosted on Microsoft Azure, Amazon AWS, Google Cloud.

Security Mitigate risk with tamper-proof data coordination and granular security controls.

Customisation Deploy permissioned networks with shared business logic and independent governance.

Speed Create and manage digital assets and Smart Contracts which can be assembled from pre-compiled templates to speed up the process.

Future Proof

Catalyst allows organisations to build, test, and deploy decentralised applications that run exactly as programmed with no downtime, censorship, fraud, or third-party interference.

Businesses, governments, and forward-thinking organisations across the global supply chain are adopting Blockchain to reduce the cost of trust, increase efficiency, and unlock new opportunities for value creation.

Listed below is a set of essential considerations that organisations typically need to address to ensure the success of any new enterprise solution. The items on this list are grounded in IT best practices and project management principles;

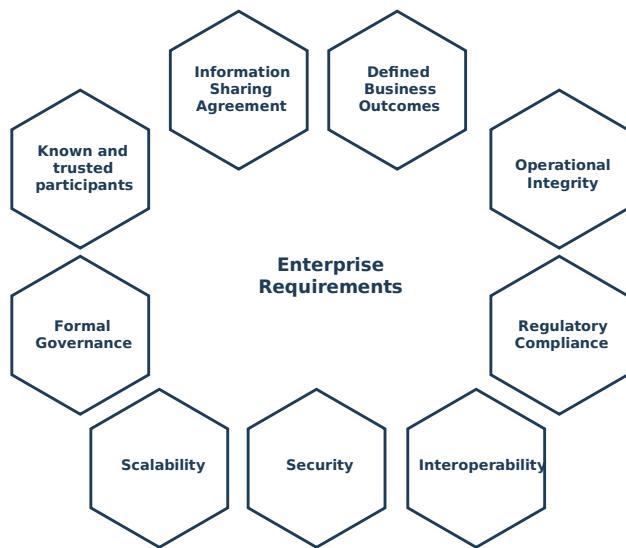


fig. 3. Essential considerations for typical enterprise technology solutions

Greater Trust & Lower Cost

Catalyst dramatically reduces the cost of trust and collaboration, which has traditionally been expensive for businesses. Catalysts inherent transparent and immutable ledger makes it radically easy for different parties in a business network to manage data and reach agreements.

Organisations can trust that their data is safe on an enterprise-grade blockchain. Catalysts decentralised architecture ensures that everything recorded is virtually impossible to hack or manipulate.

Improved Efficiency

Catalyst serves as a secure and paperless platform on which only authorised parties can exchange data and transaction records. Smart Contracts also help streamline and automate processes such as payment settlement when pre-agreed conditions are met.

Blockchain integrates information and processes within and across businesses, and has the potential to streamline and accelerate certain business processes, increase protection against cybercrime and reduce or completely eliminate the roles of intermediaries. Deloitte Canada highlights short-term actions companies can take to respond to business disruption and supply chain challenges from the global spread of COVID-19 – and looks ahead to the longer-term solution of digital supply networks.

The traditional linear supply chain model is transforming into digital supply networks, where functional silos are broken down, and organisations become connected to their complete supply network to enable end-to-end visibility, collaboration, agility, and optimisation.

Application in the Seafood Industry

Tuna, prawns, salmon, and scallops are just a few of the products that have recently experimented with or implemented blockchain technology in the seafood sector.

This transparency technology allows participants in the supply chain to see instantaneously, and at a glance, where a product is in the supply chain, where it is headed, and additional information like under what conditions it was produced or stored. Blockchain technology, such as that used in the OpenSC platform, along with IoT and machine learning, offers such benefits.

Application Programming Interfaces (APIs) can be constructed that are capable of alerting managers when a market becomes available, with the potential to match sellers and buyers automatically. Additionally, the technology could immutably connect sustainability, and fair labour attributes to products in a way that prevents exploitation by unscrupulous actors during a crisis such as the COVID-19 pandemic.

Smart Contracts that execute contract deliverables and payments – automatically will increase the efficiency of supply chain transactions in a way that better informs both producers and buyers so that they can make more informed and better decisions about how they operate their business.

These features could dramatically minimise the length and depth of the pain that our global seafood industry is currently experiencing. Given the profound and devastating impact this pandemic has had, it is time to consider a revolution in the global supply chain that will allow participants to come out stronger, more innovative and more resilient than before.

Consortia enable industry participants to learn from and build upon one another's work. Below are examples for-profit and non-profit blockchain consortia.⁸

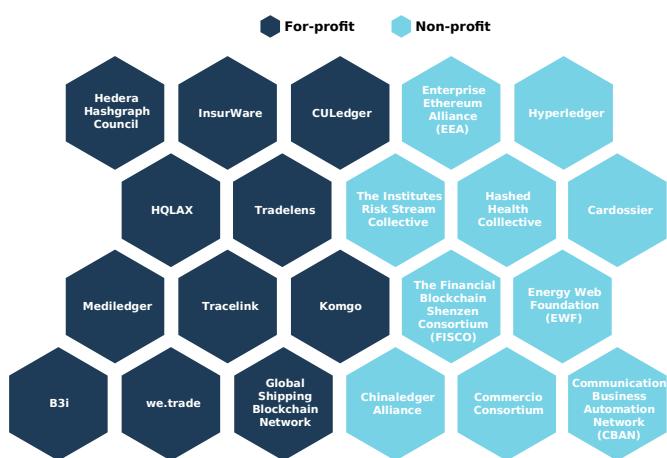


fig. 4. Examples of for-profit and non-profit Blockchain consortia (January 2020)

It may be that more than one group or technology protocol is being tested for a particular solution, and varying levels of interoperability may exist in different protocols. Since the real world is early on in the evolution of decentralised technology, there may be several groups to join to test different solutions.

While the economic performance of supply chains has steadily improved, their environmental impact and vulnerability have become major sources of concern. The responsibility for much of the physical movement, handling and storage of products has been outsourced to specialised logistics service providers, and their task grows more complex as global economic activity expands. According to Allied Market Research, the global logistics market is growing 3.5% annually and will be worth \$12.3 trillion by 2022.

Shifting Prioritise

Operators are moving away from making the supply chain as cheap as possible to making it as secure as possible, placing greater emphasis on security and less on price.

Matthias Horx, a 65-year-old futurologist, dared to make of an optimistic prediction right at the beginning of the corona crisis, arguing that many things would change for the better. He believes the crisis provides us with an opportunity to slow down the economy, to inject more solidarity into society and to learn to be satisfied with less.¹⁰

Doubling Down on Advanced Manufacturing Technologies

The amount of potential technological innovations in the manufacturing and supply ecosystem is daunting – from Blockchain and the Internet of Things (IoT) to additive manufacturing or artificial intelligence (AI).

Agricultural machine producer Grimme, has come up with a “digital potato,” essentially a potato-sized ball covered in sensors. The farmer places it in his field and then “harvests” it with a Grimme machine. As it makes its way through the harvester, it transmits all kinds of information related to optimal functionality, including potential damage done to real potatoes.

Against this overflow of options and potential use cases, it is not surprising that especially in smaller companies (revenues below \$10 billion) about a half of the surveyed executives indicated that their organisation is only low to moderate in leveraging advanced technologies effectively to adapt to new challenges quickly. However, during the COVID-19 crisis, senior executives have regularly stressed that their past investments in new technologies are paying off now.

Increased supply chain visibility as well as the ability to quickly simulate alternatives for quicker and data-backed decisions. This is supported by results from the survey showcasing that companies which effectively leverage new technologies feel that their supply chains are well capable to deal with COVID-19. In contrast, companies which do not effectively leverage new technologies feel a lot less well-prepared.

Companies aiming to leverage technologies better need to start evaluating what capabilities they would like to build and where technologies can help them to achieve it.

Advanced manufacturing technologies are only the enablers and not a means in itself. Distilling the cross-industry themes around leveraging advanced manufacturing technologies resulted in four different visions, leading companies follow to make their supply chain systems more resilient.

1. Embracing full supply chain visibility
2. Making data-backed decisions and predictions
3. Increasing agility in production processes
4. Leveraging automated processes

Full supply chain visibility is key in supply chain management, especially in times of crises. The following numbers underline why. Some companies have to manage up to 1 million raw materials, components and finished goods spread across up to 100,000 suppliers. These inputs are transformed into finished products in thousands of manufacturing steps across hundreds of manufacturing sites and eventually delivered to up to 10,000 different customers.¹¹

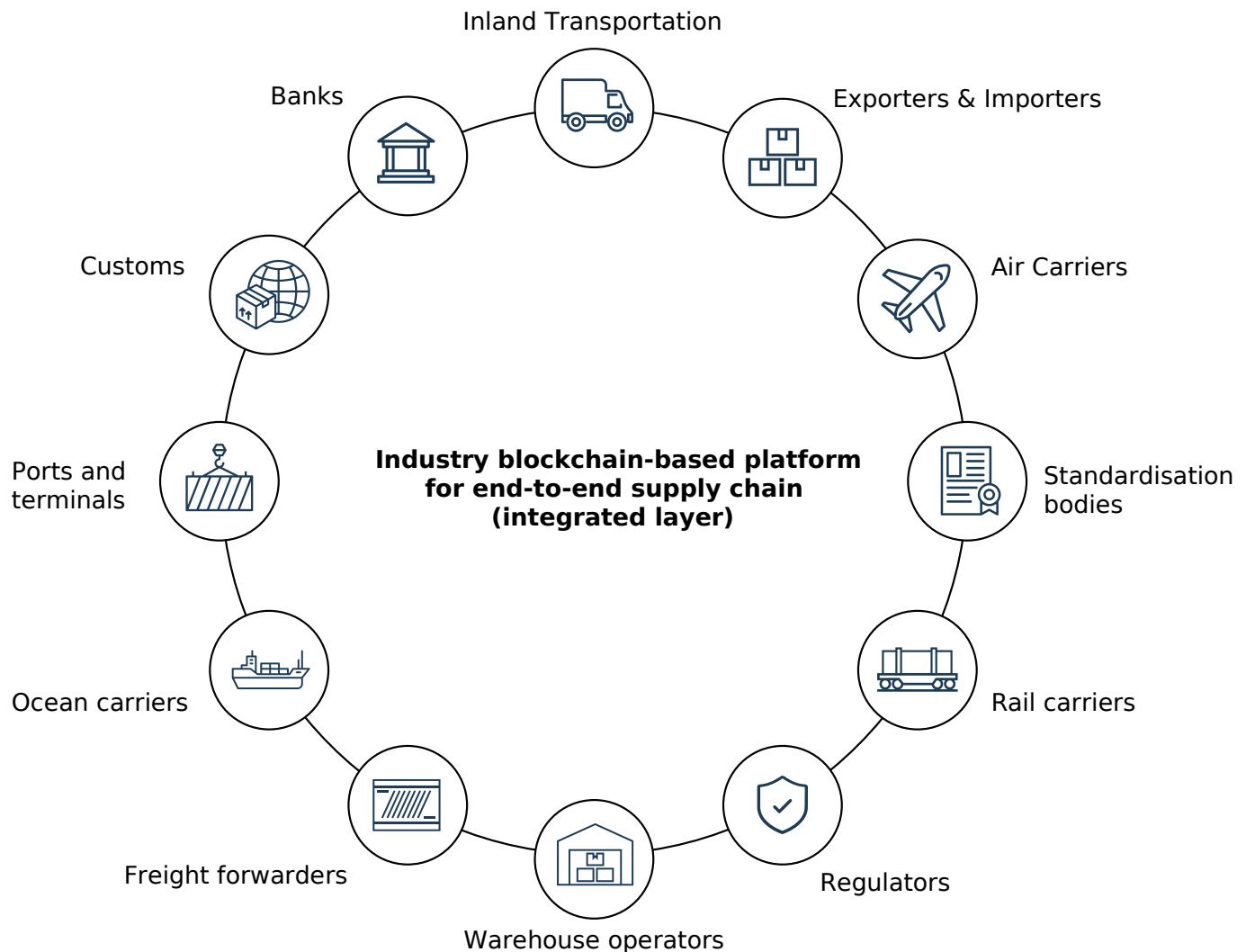
**The bottom line is this:
supply chains are highly complex.
Technology and digitalisation enable
end-to-end visibility across the supply
chain. Having this visibility - ideally in
real-time - is key to proactively run risk
analyses and react fast when a crisis hit.**
Joachim Christ, Head of Procurement,
Merck

Without having instant visibility across the entire supply chain, running this risk analysis and identifying mitigation options is hard at best, impossible at worst.

To achieve better results, companies are leveraging technologies such as big data platforms and IoT as powerful tools to gather large quantities of data, or advanced analytics to generate required insights.

A key element in increasing the resilience of overall systems is the logistics that connect the different nodes. During the crisis, capacity limitations were sometimes the reason for supply shortages. Logistics coordination across and within global value chains will be driven by new technologies enabling unprecedented levels of visibility. In addition, Blockchain-enabled applications connected with IoT sensors can reduce further roadblocks (e.g. custom clearances) to accelerate connections.

fig. 6. Example of an industry blockchain-based platform for end-to-end supply chain



Conclusion

Companies are already focused on preparing for a rapid recovery, drawing key learnings from the pandemic and its impact on the global business world. Leading institutions already had resilient supply chains, and others are now catching up as the crisis forces them to improve and strengthen their operations.

Expect to pay more for the things that you use. Companies are more than willing to invest in a more resilient supply chain and consider it as a necessity in the aftermath of the crisis. However, customers will also be expected to pay for a proportion of the increased cost base.

Against the background of the current crisis and the already mentioned set of global mega trends, shifting from cost to risk competitiveness is likely the next paradigm in supply chain set-ups and will transform the industry.

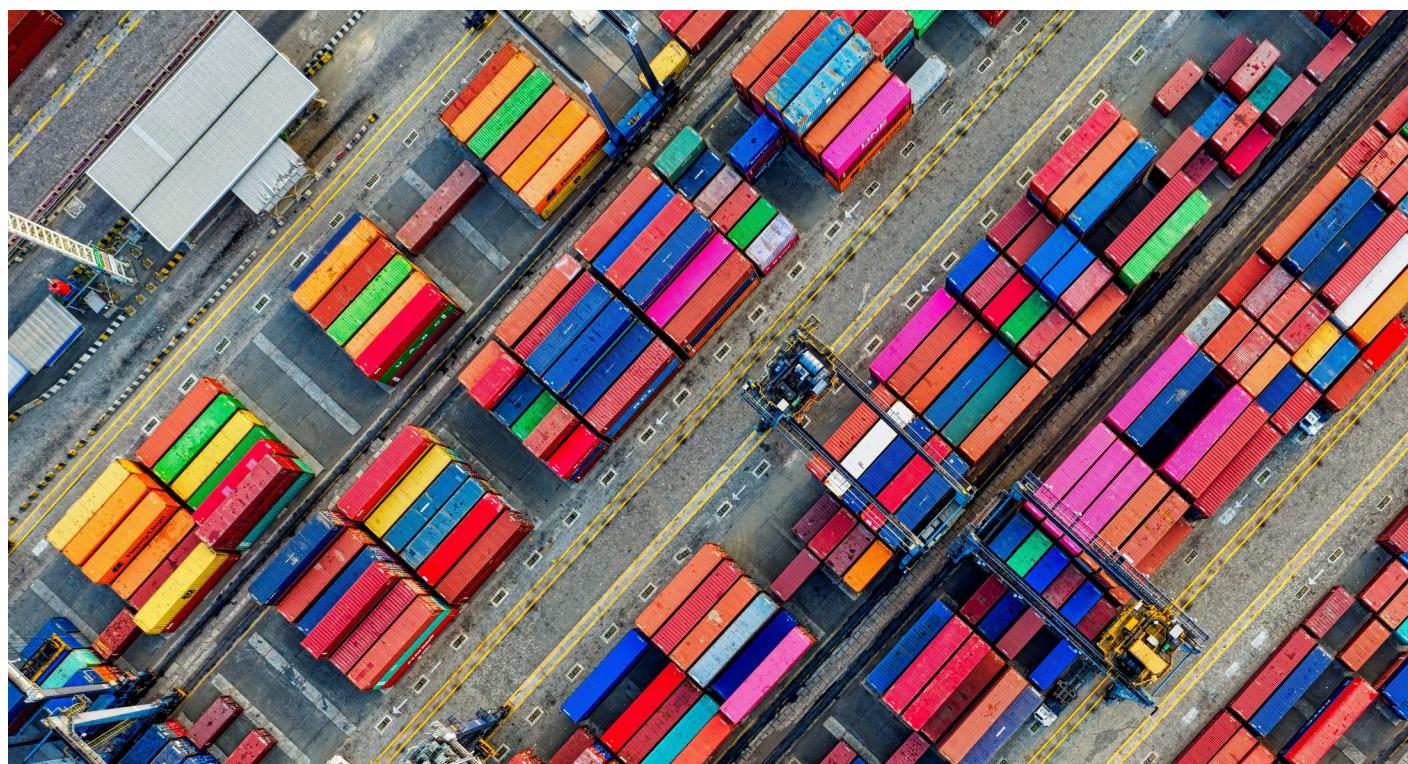
Companies have worked together in new ways with government bodies and other companies in their wider manufacturing ecosystem. The collaboration has often

proven fruitful and has accelerated progress in certain areas such as more digital processes with regulatory agencies, for example.

Experiences from the crisis on how efficiently the wider ecosystem can be leveraged for societal impact could be used and adapted to suit other societal challenges. Also, Blockchain is enabling new ways of collaboration that can start to get traction.

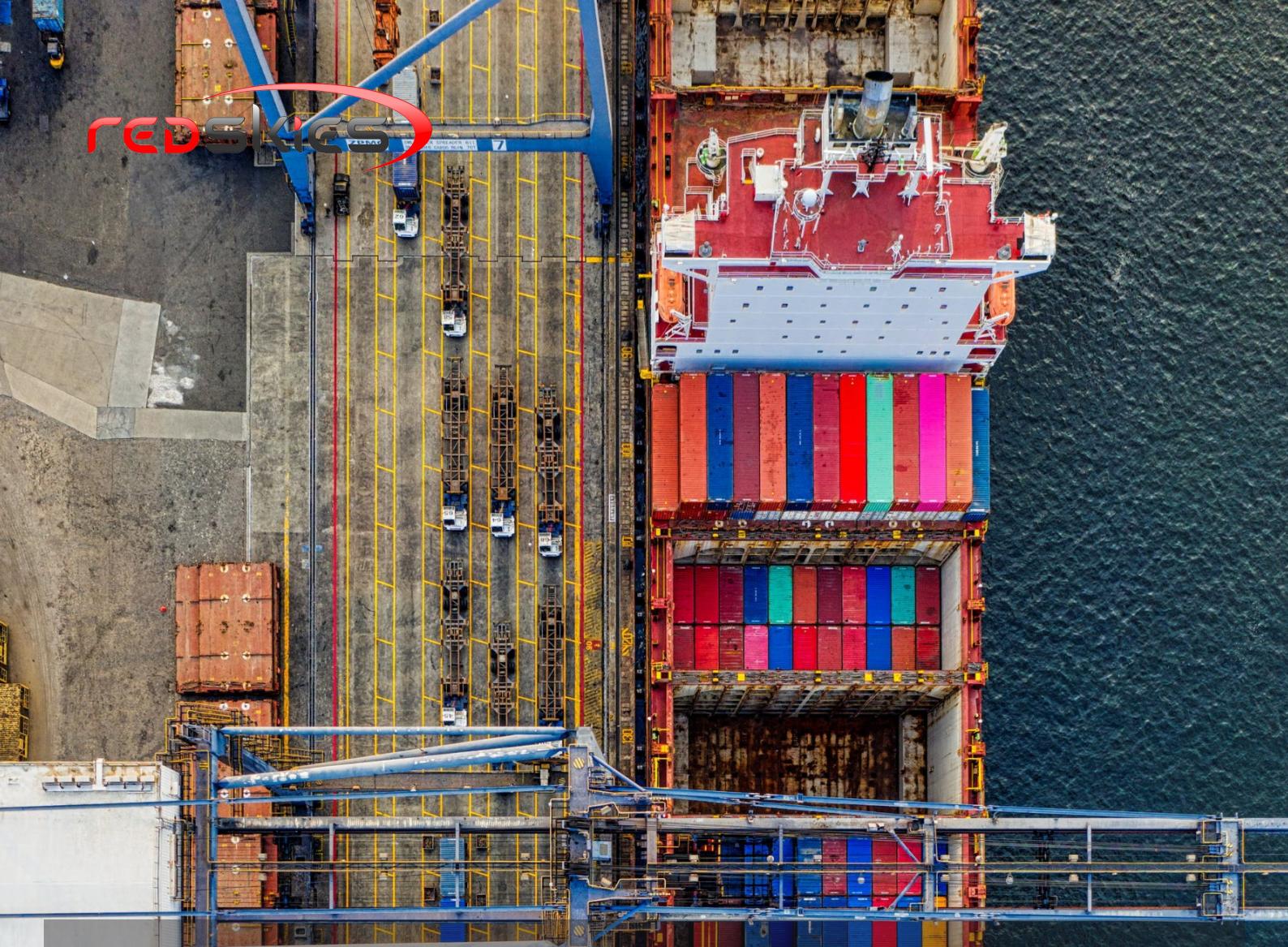
They also need to build new strategies in collaboration with governments to be able to adapt and respond to future shocks. There will likely be a long term shift in priorities from making supply chains as cost-effective as possible to make them as secure as possible.

Historically, the supply-chain industry's IT solutions have been a patchwork of centralised modules, some of which may have compatibility issues or create other challenges for organisations. The emergence of blockchain technology offers the opportunity to alleviate some of these frictions and breakdown silos.



Endnotes

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- 12** World Economic Forum, 'Blockchain Toolkit - Executive Summary', Available at <https://widgets.weforum.org/blockchain-toolkit/summary/>, page.38



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