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Mastering the raw materials and commodities Supply Chain

Overview

Commodity markets, which we are defining in this white paper as the buying and selling of raw or direct materials, have always carried risk—even before the disruptions wrought by a global pandemic. Produced and processed across complex supplier networks that span multiple countries, commodity markets are subject to geopolitical instability, climate change, regulatory restrictions, and, perhaps most critically, an increasingly dependent global supply chain that stretches across developed and emerging economies. Because of the inherent fungibility of commodities—one source of commodity goods is as good as another--that complexity is often overlooked.

That attitude is changing and for good reason
McKinsey & Company reports that supply chain disruption has increased dramatically in recent years. In just the past several years the cost of these disruptions has risen significantly: every year, one in twenty companies suffers a loss of at least US$100 million.[2]

Then COVID-19 turned the world upside-down. Shortages of critical goods, factory shutdowns, dizzying swings in demand, border closings, and transportation gridlocks converged. Few business leaders were prepared. According to a survey of 60 supply chain executives conducted by McKinsey in Q2 of 2020, 73% encountered problems with suppliers, 75% struggled with production and distribution, and almost half experienced delays in planning and decision making. More telling, at a time when their workforces and supply partners were sequestered remotely, a stunning 85% of companies reported struggling with insufficient digital technologies to support them.

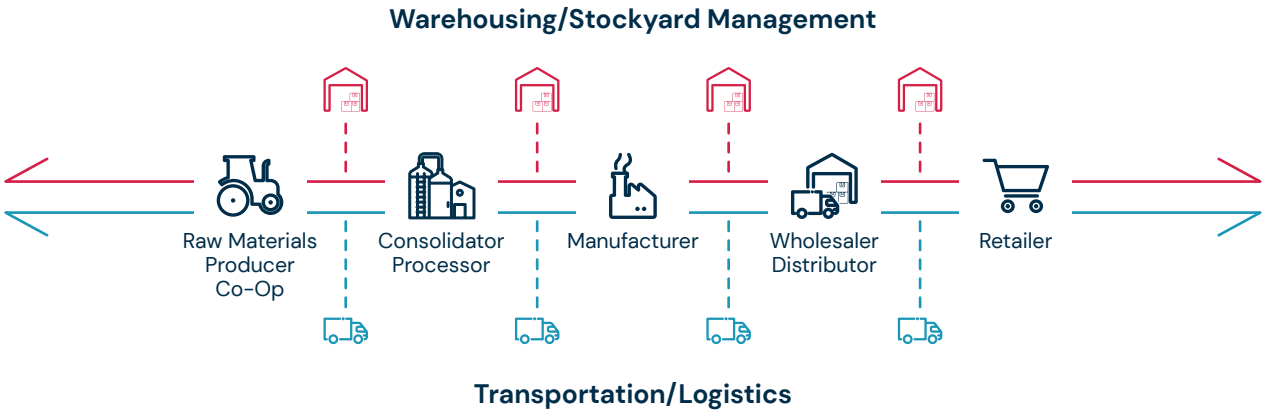
Supply chains for commodities, driven by inconsistent manual processes, disconnected systems, and inaccessible spreadsheets, were particularly vulnerable. With no visibility into unprecedented supply chain disruptions, commodities producers, traders, and consumers were unable to adequately assess or respond to a rapidly changing commodities landscape.

Commodities markets are volatile. Integrating complex, multipolar supply chains on a single platform can help you make better decisions faster to minimize risk and drive value.

Copper prices are flat. Chinese imports of aluminium have surged. Shipping rates remain high.

And that is just this week.[1]

[1] https://spendmatters.com/2020/08/14/commodities-roundup-shipping-rates-rise-copper-flattens-iron-ore-supported-by-chinese-demand-supply-concerns/
[2] Alicke, Knut et al. Is your supply chain risk blind—or blind resilient? McKinsey & Company, May 2020



Companies that produce, procure, or trade raw materials are eager to realize the benefits of well-defined processes supported with digital technologies—at all points across their value chains. Indeed, for these companies, the inability to identify risks and respond quickly to disruptions can be especially costly. For the past, several years many companies have turned to commodity management solutions to support the buying and selling of commodities, their transportation and delivery, and any associated risk management processes.

While those solutions are critical to evaluating and tracking assets, the need for specialized supply chain support—particularly at critical transfer points across stockyards, bulk terminals, warehouses, and port terminals—remains. New technologies like IoT, AI/ML, and 3D modelling are making it easier to track and manage raw materials so that companies can begin to answer critical questions about the status of their goods—from manufacturers and growers to storage facilities to ports and processing plants. But without an integrated view across the commodities lifecycle, those technologies will fail to deliver the level of visibility that global enterprises need to build resiliency, manage assets more intelligently, and make decisions in real time as conditions on the ground continuously change.

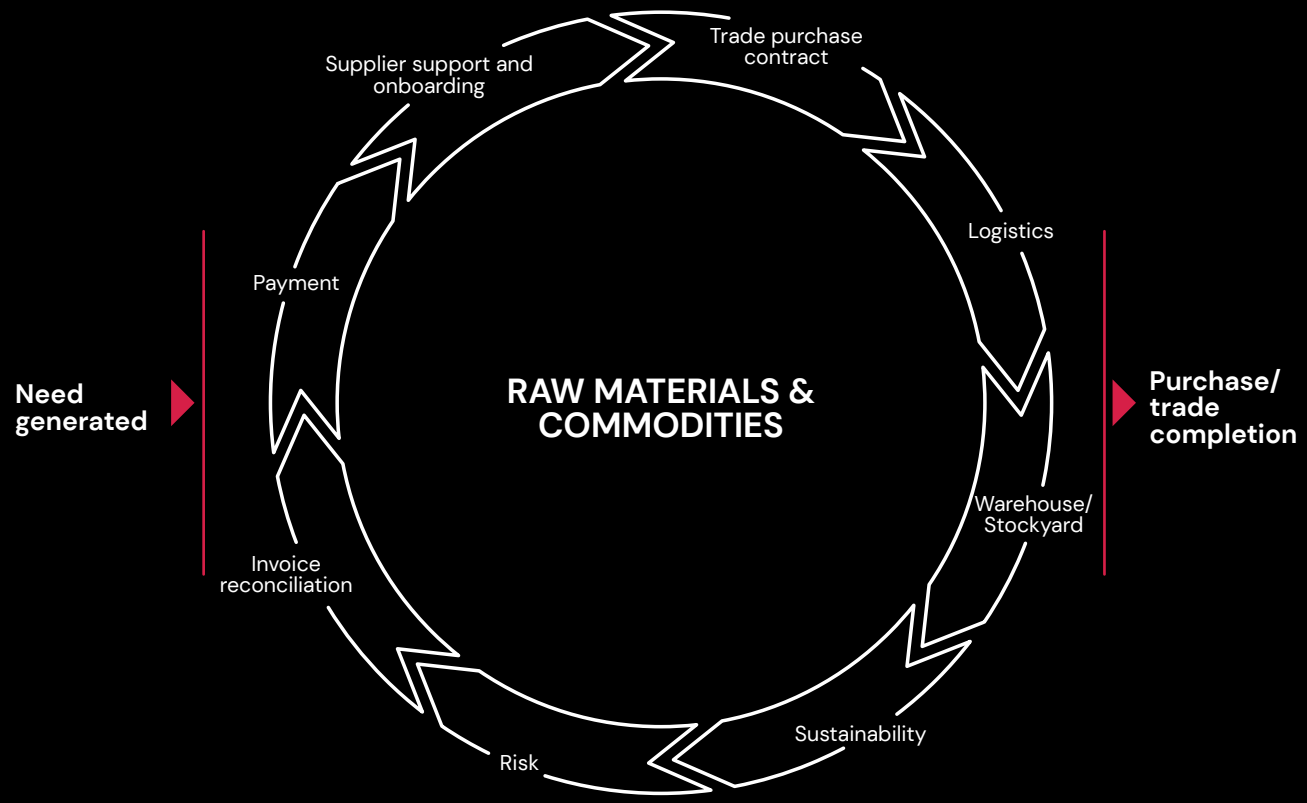
Building a more resilient raw materials supply chain: A critical imperative

Building resiliency across the raw materials supply chain today is a critical priority. The ability to respond more nimbly to unanticipated disruptions—and recover faster—has never been clearer. Commodities risk management today involves a deep understanding of markets, macroeconomic indicators, regulatory exigencies, and price and cost fluctuations. Producers, buyers, and traders are adept at managing a diverse portfolio of strategies to mitigate risk--optimizing production and pricing, participating in exchanges, and designing contracts and other financial instruments to hedge against loss.

But as the lessons of the pandemic have made clear, risk is embedded at every point across the commodities lifecycle. A mill with capacity but no visibility into whether its suppliers will be able to fulfill orders is unable to secure alternative sourcing. A lack of storage capacity to receive shipped goods prompts an expensive scramble for warehouse space. Standardized processes for stockpiling make it difficult to verify quality precisely enough to blend materials with confidence.

Organizations seeking to master this volatility will need a more granular view across every step of their supply chains.

The commodity lifecycle for raw materials involves a global network of producers, transportation providers, storage and processing facilities, commodity traders, and consumers. At every point in the chain, people, processes, and technologies need to be seamlessly connected for up-to-minute decision making about critical assets.



Realizing the vision of a more connected, transparent, and resilient commodities supply chain has a couple of significant challenges.

Global complexity

Today's commodities and raw materials are most often sourced, stored, shipped, transformed—and ultimately bought and sold across multiple borders. Planning and executing the movement of goods across geographies has become increasingly fractured not only by trade and tariff difficulties but by increased regulation and shifting consumer demand.

Multiple systems for handling origination, handling, and processing

Across this global value chain, most organizations handling raw materials rely on disparate and disconnected systems, including ERP systems, planning and control systems, SCM systems, stockyard and warehouse management systems, task execution and tracking systems, and trading and risk management solutions. Legacy systems are proving inadequate and managing integrations between them is cumbersome. Usability—especially support for remote collaboration—has fallen behind other industries.

Little support for complex business processes

Raw materials still move from production to storage to transport with little insight. That's a problem—particularly as consumers demand more visibility into how goods are sourced and produced, and companies are increasingly valued by sustainability measures. As well, in upcountry facilities market behaviours and price fluctuations are often invisible, data capture is prone to errors, and audit trails are non-existent. As goods move through the supply chain, transport logistics and capacity are difficult to optimize, and processing capabilities remain opaque. Financial and contractual detail that helps increase margins and drive value are often only captured in spreadsheets.

Multiple parties, too little communication

Roles and responsibilities have become more defined in recent years as supply chain management has continued to be formalized. Enabling every participant across the supply chain to collaborate more efficiently is key to supply chain resiliency. In commodities markets those roles and responsibilities are distributed across a supply chain where raw materials are mined and farmed, refined and processed, stored and shipped, traded and consumed. Keeping suppliers and producers connected across multiple touchpoints is difficult--especially in remote or rural locations where digital infrastructure is spotty and people are performing most of their collaborative tasks via a smart phone.

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Connecting commodity practices and processes

Eka, a global leader in providing digital solutions, deploys integrated tools and technologies to help companies plan and execute the movement of goods across the trading value chain with more insight. Commodity producers of all types can manage capacity, shipping, and storage with greater flexibility. Agriculture, energy, metals, and mining operations can automate process decisions, improve utilization of assets, and gain real-time visibility into material movement, inventory, and quality.

Eka's supply chain solutions, integrated on a single cloud platform, are purpose-built for direct materials businesses. They push beyond standard stockyard management and warehouse automation practices to deliver precision modelling tools that deliver deeper visibility into what's happening on the ground. With a more granular view of equipment and goods, businesses can dynamically adjust operations in real time to increase throughput, manage quality more flexibly, and simulate task planning to facilitate faster decision making.

A deep understanding of the raw materials supply chain has helped Eka design and deliver solutions that are helping commodity focused organizations improve operations, manage quality, and deploy cutting edge technologies to manage goods with more insight and intelligence.

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Redefining operations: Dynamic control for improved throughput

Storage, blending, and transfer operations are among the most critical touchpoints in the raw materials supply chain. Those activities are supported by efficient and specialized bulk terminal automation solutions that—ideally--provide visibility into assets, improve facility utilization and, ultimately, increase gate throughput.

In the era of IoT sensors and RFID, stockyard management has become more efficient, but adapting these tools for raw materials—often delivered in stockpiles—has proved elusive. Machine management is one area where automation has taken hold, but that automation is limited by a 2-dimensional view of the stockyard and its many moving parts. Operators can typically only impose a set of standard collision requirements across their machine assets, requiring, for example, that one piece of equipment remain 5 meters from another.

At Eka, we're pioneering 3D modelling to bring new levels of visibility and control to stockyard or terminal operations. Site operators can see all of their assets in a graphic representation to plan and execute receiving, transfer and loading tasks more effectively. With 3D modelling, machines can work in closer proximity—within a meter of each other rather than 10. In addition to supporting more efficient performance and increasing throughput, 3D modelling effectively enlarges the footprint of the stockyard, allowing companies to carry additional inventory without expanding their facilities.

Redefining quality: Precision stockpile management

The science of stockpile management continues to evolve. But even a well-stacked stockpile presents challenges for commodities producers who must constantly weigh quality against throughput in order to meet contract requirements. Standard processes that producers rely on to manage delivery are effective—to a point. But these processes fail to account for subtle quality differences within the stockpile. Without real-time visibility into the stockpile, producers are at risk of underdelivering on contracts, triggering penalties. To avoid those penalties, many producers err on the side of overdelivering, often exceeding quality parameters by as much as 2%.

Today, 3D modelling allows organizations to manage their stockpiles more precisely by scanning materials as they flow into the stockpile, modelling that data, and delivering a digital twin of the stockpile to operators. These models are able to calculate quality issues in real time as goods are stacked, reclaimed, blended, and delivered to buyers. In other words, as stockpiles are being stacked from multiple sources, as those layers are being reclaimed by various means and blended for delivery, stockpile operators have a very precise—and even predictive—understanding of stockpile quality from receiving to delivery.

Those insights have multiple applications. Rather than relying on a pre-programmed sequence of events to automate operations, operators can now apply unique control techniques to optimize operations—running several jobs on a conveyor belt and dynamically adjusting them on-the-fly, for example, rather than running the belt for a fixed period of time, clearing it, and beginning again.

While improving throughput is important, operators are also using this data for more precise and predictive quality management. As materials are stockpiled, operators can collect vast amounts of information about how these materials were sourced and transported, treated and processed. All of that information can be tracked to a precise location in the stockpile and traced as stockpile materials are reclaimed and blended.

For Eka customers who rely on lab results to certify contract requirements, real-time insight into the quality of their materials has been game changing. In the minerals industry, producers typically rely on lab results to certify quality thresholds for delivering. Because those results are often returned well after a vessel has left port, producers are forced to rely on standard calculations to determine blending operations.

With data collected from 3D modelling, operators are now able to predict the quality of their loads in real time and within 0.2% of contract thresholds. This allows producers to make blending modifications immediately, dynamically adjusting how to load a vessel to optimize how they will meet contract requirements.

Redefining the future: Doing more with your data

Commodities management thrives on data. And today, businesses are looking for new ways to monetize their data—moving from decision support activities to predictive insights that drive the business forward. Many companies are using already using data collected from IoT sensors and time series analysis to improve performance and throughput—a strategy that minimizes capital outlays for infrastructure reengineering. As data from across the supply chain continues to be collected and analyzed, what's possible to do with that data will transform how commodities are managed.

At Eka, we continue to invest in research and development across the commodities supply chain, seeking new ways for sellers, buyers, and traders to optimize operations and discover new opportunities and, potentially, new markets. Among our new research and development initiatives, we have recently launched a pilot project that combines 3D modelling with predictive simulation, using machine learning to ask (and answer) new questions about stockpile management: how many stockpiles are optimal for any given stockyard or bulk terminal?

What elements are best combined to deliver more value to a customer? What kinds of materials should be kept separate? Is it more optimal to blend as you stack or to blend onboard a vessel? What would it mean to follow the lead of consumer brands and deliver more "personalized" or bespoke silos?

Answering those questions will require significant amounts of data from across disparate sources. Increasingly, companies that want to set themselves apart will need to rely on a connected network of suppliers, sellers, buyers, and traders not simply to optimize operations, but to reimagine how commodities markets will continue to thrive.

End-to-end commodity intelligence

The disruptions driven by the pandemic exposed the need for those operating in commodity markets to master business processes across their value chains while developing a deeper understanding of the assets—people, processes, and technologies—that move commodities across that value chain. At the same time, the pandemic helped us understand the critical importance of just-in-time management—especially at the most vulnerable points in the supply chain. The need for better analytics, faster decision making, and tools that can automate processes not just with precision, but with intelligence, is clear.

At Eka, we are uniquely positioned to deliver against these challenges. We have designed a scalable, accessible cloud-based commodity market platform that leverages our expertise across the commodity value chain. We deliver pre-built applications and services, designed to address the specific needs of the commodities market, that can be deployed quickly on a native cloud platform. From source to trade, we provide applications that deliver real insight, improve collaboration, and drive value.

Companies can begin their journeys to supply chain excellence following different paths, from full-scale infrastructure modernization to deploying a single service to improve supply chain visibility. Most organizations will want to start small: implementing a solution like Smart Scales to automate weighing and receiving. Because services can be easily integrated on a single platform, organizations can build the supply chain capabilities that make sense for them: scanning the stockyard for more precise collision control or the stockpile for better quality management.

If you would like to learn more about how to begin your journey to a more resilient supply chain that can deliver value for your stakeholders, **contact us today.**

100+
Customers

4000+
Users

50+
Apps

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About Eka Software Solutions

Eka Software Solutions is a global leader in providing digital solutions for Trading & Risk, Supply Chain Management and Financial Services driven by Cloud, Blockchain, Machine Learning and Analytics. The company's best-of-breed solutions serve the entire trading value chain across agriculture, energy, metals and mining and manufacturing markets.

Eka's Cloud Platform provides advanced analytics, one source of data and an automation engine, providing maximum flexibility and investment protection as business needs and market requirements change. Eka is committed to ensuring its 100+ clients can work from anywhere and collaborate across ecosystems within a secure and trusted environment.

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