



Complexity, transparency and integrity

The forces shaping the future of supply chain assurance

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Introduction

In the late 18th and 19th Centuries, as economies in Britain, Germany and the US started to industrialise, people streamed out of rural areas to seek work in factories and mills. In doing so, they created not only great cities, but also an entirely new phenomenon – consumers.

No longer able to grow their own food, city-dwellers become dependent on others to provide sustenance. Rudimentary supply chains emerged, connecting agricultural production with processing, packaging, preparation, vending and consumption.

Unfortunately, for some there was one final step in the supply chain - the mortuary.

In 1820, German chemist Frederick Accum, published an incendiary essay called *Death in a Pot!* Accum, who was working in London at the time, scandalised citizens by revealing that flour frequently contained chalk, cheese was often laced with lead, and arsenic and chrome were commonly used as food colourings.

It was Accum who coined the term “food adulteration”. His solution was to provide consumers with a series of tests they could perform at home to check the wholesomeness of food products.

It wasn't long before governments started to intervene. In 1842 the Laboratory of the Board of Excise was founded in the City of London to regulate the adulteration of tobacco which was prohibited under the Pure Tobacco Act. In 1875 the laboratory – the forerunner to LGC - was appointed ‘referee analyst’ under the new Sale of Food and Drugs Act.

Nevertheless, the practice of padding out food products with cheap, often dangerous, fillers continued. Perhaps the most historically important example is horseradish sauce which was popular among English and German immigrant communities in the US, but time consuming and difficult to prepare at home.

Plenty of entrepreneurs stepped forward to offer convenient solutions in bottles and jars, and to maximise their profits they would routinely bulk out the contents with turnip and even wood fibres. It was Henry Heinz who recognised that putting his sauce in

clear glass packaging would send a strong signal of purity and wholesomeness.

It worked, and Heinz went on to build his fortune on the promise of unadulterated, nutritious food that consumers could trust. In 1906, Heinz became the only food manufacturer to support legislation that would become the Pure Food and Drug Act. In the intervening years we have seen the evolution of a multitude of regulations, standards, testing regimes, technologies and processes designed to guarantee the safety and integrity of food products, nutritional supplements and other consumer goods.

As we emerge from a global pandemic, one that has exposed frailties in numerous supply chains, we stand on the verge of a new era in product assurance. It is an era characterised by globalised trade, networked consumers and active investors. An era in which compliance is necessary to confer supply chain confidence, but no longer sufficient.

This is the era of intelligent assurance – a performance-led philosophy that connects every touchpoint in the supply chain to protect the consumer and safeguard brand reputation.

In this paper we examine the global forces that are transforming supply chain assurance from a series of interventions to mitigate risk to a connected strategy to drive value and reduce risk.

Force 1 – Complexity

Supply chains have grown in length and complexity in recent years as companies have expanded around the world in pursuit of margin improvements. According to McKinsey, the value of goods traded globally has tripled to more than \$10 trillion annually .

This lean, global model of manufacturing has achieved improvements in the form of reduced inventory, shorter lead times and improved margin, but it has also come at a cost, with supply chains that are harder to manage, less resilient and more opaque.

Visibility is critical at a time when supply chains have never been so complex. Global supply chains involve multiple intermediaries pre and post manufacturing where goods and end products are passed between

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factories, shipping vehicles, pallets, warehouses, and delivery fleets. The journey is fraught with risk. Logistics companies and, increasingly, retailers and wholesalers take on the bulk of this responsibility.

Logistics is no longer a hidden operational function concerned with simply moving goods from A to B. The growth in e-commerce has led to increased service expectations combined with a greater need for personalised, individual, and bespoke orders. Supply chains have become faster, more flexible, and more customised to meet the needs of the markets they serve.

McKinsey outlines five key drivers of supply chain vulnerability, with transport and logistics playing a key role in addressing the resilience of the physical-flow and logistics networks.

Reliance on Just-In-Time (JIT) supply chains and their fragility hit the front pages in the early days of the pandemic when supermarkets were, albeit temporarily, stripped of everyday essentials as people stockpiled and national shutdowns impacted global logistics and supply chain networks.

Fear of not being able to procure goods remained one of the main features of lockdown as COVID-19 spread. It was an important lesson for manufacturers and logistics service providers. The reputation of JIT was transformed overnight from a cost effective, lean model, to a liability, forcing businesses to re-evaluate their dependency on supply chain partners. Existing relationships were re-evaluated as confidence in partners' ability to deliver what was needed, when it was needed and where it was needed safely was called into question.

There is now a shift towards micro-fulfilment centres and the introduction of automation technologies to address some of this risk in retail supply chain strategies, particularly among grocery chains. This change in retail behaviours will become more entrenched post-pandemic as retail migrates online.

Only those supply chain partners who can adapt to current conditions and mitigate future vulnerabilities will stand out.

Supply chains as critical infrastructure

In 2016, BSI highlighted the increasing frequency of deliberate attacks on global supply chains, recording a total of 346 terrorist attacks that year with a threefold increase on agriculture and food and beverage targets. This threat is unlikely to decrease. Since COVID-19, many governments, such as those in the US and UK, have elevated food supply chains to 'critical infrastructure' status joining transportation, commerce, railways, and utilities such as electricity and water. All vital systems required for the proper functioning of society and economy. As such, they become a much more visible target for terrorist attacks.

Contamination across borders

Each year, 200 billion metric tons of food is transported around the globe, 35% by land, 60% by sea, and 5% by air. The volume and variety of goods being shipped and the many conditions that determine how it is transported including temperature and handling requirements, underlines the vulnerability of global food and beverage supply chains to possible contamination during storage and distribution.

Traceability and accreditation have become a critical part of this process. Regulatory requirements are becoming more stringent to deal with the proliferation of cross border trade and brands and retailers need to focus more on ensuring compliance. Across the European Union, Regulation (EC) 178/2002 stipulates that businesses must be able to identify the firms from whom they have obtained food, ingredients or food producing animals and those they have supplied with products and must be able to produce this information on demand.

China, compared with other large economies, is still in the developmental stage of traceability regulations but this is set to grow. Since June 2009, Articles 36–41 of the Food Safety Law require food producers, processors, packers, and retailers to implement testing and record-keeping systems for all inputs, and to archive the records for at least two years.

In addition, investors and consumers are seeking more information about the origins of the goods

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they buy and how they are transported and stored. Consequently, brands and retailers are under pressure to share information about their complex global supply chains. All parties are seeking reassurance that the handling of goods has been certified to clear accredited standards at each stage. Process traceability is an intrinsic part of this process as Paul Bulcke, Nestle Chairman, outlined in a World Economic Forum report on Food Value Chains:

“Ensuring traceability is vital to providing transparency and building consumer trust in the content, quality and sustainability of the end-to-end food supply chain. New technologies, such as blockchain and satellite imaging, can strengthen traceability programmes and lead to better transparency and value across the supply chain.”

Although advancing technology has increased efficiency and automated checks and balances with developments in traceability, monitoring and testing, the risk of contamination food or medicine or high-risk goods remains. An increased level of visibility into the supply chain will differentiate products in the marketplace and provide a level of much needed security for end consumers.

Around a fifth (18%) of business leaders who responded to McKinsey survey in May 2020 cited risk-prone logistics as the primary condition that makes their company most vulnerable to value chain disruptions. Where disruptions occur, financial consequences follow.

Poor risk management can put a firm in breach of their insurance terms in the event of damage to or loss of a consignment. It can also result in contamination of perishable items that have been stored under sub-optimal conditions or result in lack of product availability for the markets they serve. All have significant implications for the financial bottom line and, ultimately, erode consumer trust, which can be hard to win back.

Global trade; local regulation

We are told we live in an increasingly globalised world, yet when it comes to regulation, the planet is in fact a patchwork of standards and enforcement.

Take the issue of lead in paint. Around the world, Jurisdictions have vastly differing regulations on

what is an acceptable rate. A study by IPEN, a global NGO, found that in decorative paints sold for home use in Mexico a quarter contained dangerously high lead concentrations - greater than 10,000 parts per million (ppm). In contrast, the maximum permissible limit on lead in paint in the USA and Canada is 90 ppm—the same threshold recommended by the UN Environment Programme.

In 2016, a Canadian woman was repeatedly hospitalized for unexplained severe abdominal pain following prolonged use of ceramics purchased in Mexico. Tests revealed that the glaze on both the inner and outer surfaces of cookware ceramics contained 17% lead. As a result, her blood lead concentrations were nearly 36 times the upper limit of what is considered “normal”.

Several different standards regulate lead in consumer products in Mexico but there is no overarching law or regulation. The US banned pottery imports from Mexico that aren't labelled 'lead-free' two decades ago. But lead-free labelling can deceive. Tamara Rubin, a lead poisoning prevention campaigner from the US, reported on her website in 2018 that “most of” of the lead free labelled Mexican pottery she has analysed tested positive for at least 1,000 ppm lead.

The online purchase of banned or sub-standard products represents a cross-border problem that global governments are struggling to address.

Analysis by the United Nations Conference on Trade and Development (UNCTAD) found that many developing, and transition economies still lack laws to protect consumers online. Of 134 countries for which data were available, 110 had legislation on consumer protection related to e-commerce - varying from 73% in Europe to 46% in Africa and 72% in the Americas. In as many as 57 countries, it was not possible to obtain data at all.

Of course, product testing is only useful when the testing itself is reliable. Errors in testing arising from poor laboratory practices and inadequate training are common, which is why laboratory Proficiency Testing (PT) has emerged as a critical part of supply chain assurance, ensuring that product testing meets global and local standards.

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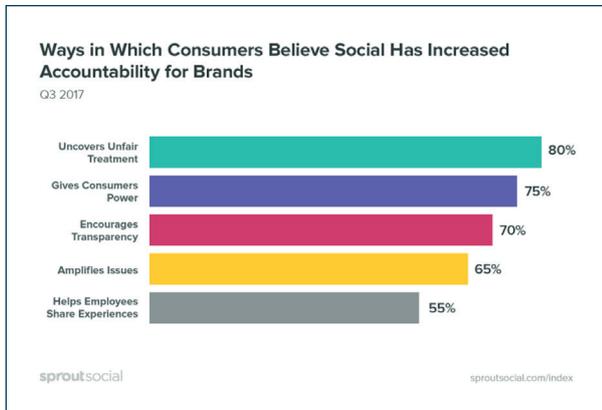
Force 2 – Transparency

In an era of fake news, data breaches and privacy concerns, consumers are demanding greater transparency from brands. The rapid evolution of digital technology and social networks is increasing the risk of poor practice being exposed.

US research firm Sprout Social asked 1,000 consumers about their transparency beliefs, expectations and desires. They found that 86% of people say transparency from businesses is more important than ever.

More than half of consumers (53%) are likely to consider brands that are thought to be transparent on social media for their next purchase while a lack of transparency leaves 86% of people likely to take their business elsewhere.

Seventy five per cent of consumers say social media has empowered them to interact with brands, according to Sprout Social, any many believe social media is responsible for increasing brands' accountability.



According to a McKinsey study, consumers are demanding to know much more about a range of issues, from where and how items are made to provenance and quality.

Consumers are increasingly concerned about issues including labour standards, sustainable sourcing, and environmental impact, with 66 percent willing to pay more for sustainable goods. Some 42 percent of millennials say they want to know what goes into products and how they are made before they buy, compared with 37 percent of Gen Z.

More than half of millennials say that they always research for background information before buying, compared with 45 percent of Gen Z consumers and 41 percent of baby boomers. Reviews and articles are common sources of information.

McKinsey identifies three key dynamics arising from these trends. First, businesses will rigorously audit their supply chains to identify practices that may erode consumer trust. The lens for this analysis could be, "What would my customers think if this was on the front page of a newspaper?" Second, brands will invest to address any problem areas. Third, businesses will highlight their best practices to create a competitive edge.

Force 3 - Integrity

Consumers

Consumers who make active decisions about what they consume in a bid to mitigate negative social and environmental impacts have become mainstream. More than half of European consumers are willing to pay up to 20% more for sustainable food products.

In the UK alone, sales of ethical food and drink increased from £5.7 billion in 2013 to £8.2 billion in 2018 including organic, Fairtrade, Rainforest Alliance and Marine Stewardship Council (MSC) certified products. Sales of ethically certified food and drink are projected to rise considerably by 2023 to reach £9.6 billion .

This trend for ethically sourced goods which comply with a recognised standard encompasses sustainable supply chains that provide for the ethical treatment of animals and of workers. The Fairtrade Foundation cites pan European research covering 5,000 consumers who participated in the 'Trade Fair, Live Fair' survey. Just under a third prioritised paying workers a fair, living wage and ensuring that animals are not harmed during production and 40% said their top priority is that food and drink is produced in a way that does not harm the environment.

Global supply chains are under constant threat from environmental degradation, politically motivated tariffs, underdeveloped or poorly maintained infrastructure and abusive labour practices. Workers'

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rights have been further damaged by the mass casualisation of the workforce, a consequence of globalisation.

Calls for all parts of the supply chain to be subject to the same standards wherever sourcing, manufacturing or selling takes place are widespread and the commercial benefits for retailers, manufacturers and brand owners are evident.

In poll conducted on behalf of Changing Markets Foundation, 79% of UK respondents said that clothing brands should provide information on whether the workers in their supply chains are paid a fair living wage, and more than half would be put off buying from a brand that does not do so.

An MIT & Harvard study demonstrated the substantial positive effect of garment provenance labels on sales. Such labels increased sales of one high value women's garment by 14% even in price sensitive outlet stores.

The conscious consumer seeks to act to address the negative impact of complex global supply chains and their perceived lack of transparency. For them, the traceability of the goods they purchase is growing in importance. This emerging trend is facilitated by technology which helps them see clearly through supply chains. Greater connectivity has increased consumers' ability to make in-situ informed choices about prospective purchases.

Brands are responding because they know it makes financial sense to be more cognisant of consumer concerns. The spotlight is firmly on food manufacturers because the global food system is the single largest driver of global environmental change, contributing to 24% of greenhouse gas emissions and being the primary cause of vertebrate biodiversity loss since the 1970s.

Food retailers have acted by setting up online platforms to encourage suppliers to share best practice in sustainability. Nike, Adidas, Levi's and Gap, have signed up to sustainability targets which include publicly naming their suppliers but there is growing evidence that consumers do not yet trust brands to help them make the right ethical and sustainable choices.

Currently, fewer than one in five people trust sustainability information provided by clothing brands and over 50% believe that increased regulation is the only effective way to prevent fashion industry practices that damage the environment and take advantage of low paid workers.

Investors

Less than ten years ago, ESG (Environment, Social, Governance) was a Cinderella consideration in investment decisions. In recent years we have seen it emerge to become one of the key drivers for institutional, private wealth and retail investors.

The Global Sustainable Investment Alliance is a collaboration of membership-based sustainable investment organisations whose mission is to deepen the impact and visibility of sustainable investment. They estimate that, at the start of, 2018 global sustainable investment reached \$30.7 trillion across Europe, USA, Japan, Canada, Australia and New Zealand, a 34% increase since 2016 (13).

Basing investment decisions on sound environmental or social governance has a critical role in long-term investment strategies because shareholders are demanding value-based investment options.

ESG investor focus is set to continue, propelled by the expansion of public-private partnerships which give private capital more of a role to play in social investments, the shifting dynamics of energy markets as they transition to a more sustainable, low-carbon economy, and perhaps most significantly, the growth in influence of Millennials i.e. those born between 1981 and 1996.

In the US alone, over the next 20 years, more than \$30 trillion is projected to fall under the control of Millennials, the largest inter-generational transfer of wealth ever known. This wealth transfer lands with a generation raised alongside climate change and one more prone to select investments based on values and personal priorities.

While 66% of global consumers are willing to pay more for sustainable brands this rises to 73% for global Millennials, up from 50% in 2014. This is echoed by Morgan Stanley's 'Sustainable Signals' report which covers survey findings from 1,000 active individual investors and notes that 61% of Millennials

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have taken at least one sustainability-oriented investment action in the last year.

ESG is an investment driver yet its evaluation is not straightforward, and no universal criteria exists to facilitate clear benchmarking against non-financial factors. Current ESG-rating methodologies risk oversimplifying or relying too heavily on subjective evaluations. Clear standards for ethical investing evaluation are required to provide an impartial mechanism for assessment.

From Compliance to Confidence

These three forces – Complexity, Transparency and Integrity – are combining to create the need for a more connected approach to supply chain assurance, with the emphasis on ever improving performance rather than compliance with minimum standards. With weaknesses in supply chain performance presenting an ever growing threat to brands the importance of proper standards and certification, underpinned by tested and validated systems and effectively managed processes, is immeasurable. LGC ASSURE is a business with a mission to provide intelligent assurance across supply chains. It brings together four LGC businesses, with the common vision of “Science for a Safer World”. Individually, each business is a leader in its field; together they offer a connected series of solutions for customers and their supply networks.

LGC ASSURE serves manufacturing, laboratory, ingredients and supplements sectors. It comprises:

- **AXIO**, a world leader in laboratory proficiency testing
- **BRCGS**, the operator of the world’s most rigorous third party quality & safety certification schemes
- **Informed**, the number one name in sports supplement analytical services
- **Safefood 360**, the developer of best in class food safety and supplier quality management software

LGC ASSURE also offers world leading human drug and animal sports testing provided by Sport and Specialised Analytical Services (SSAS).

LGC ASSURE helps customers to:

- Test and validate systems
- Verify product performance and integrity
- Manage processes efficiently and effectively
- Collect and analyse data to predict future risk

The result is complete confidence for brands and their consumers.



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