Leveraging Digital to Ensure Supplier Reliability

SUPPLY CHAIN

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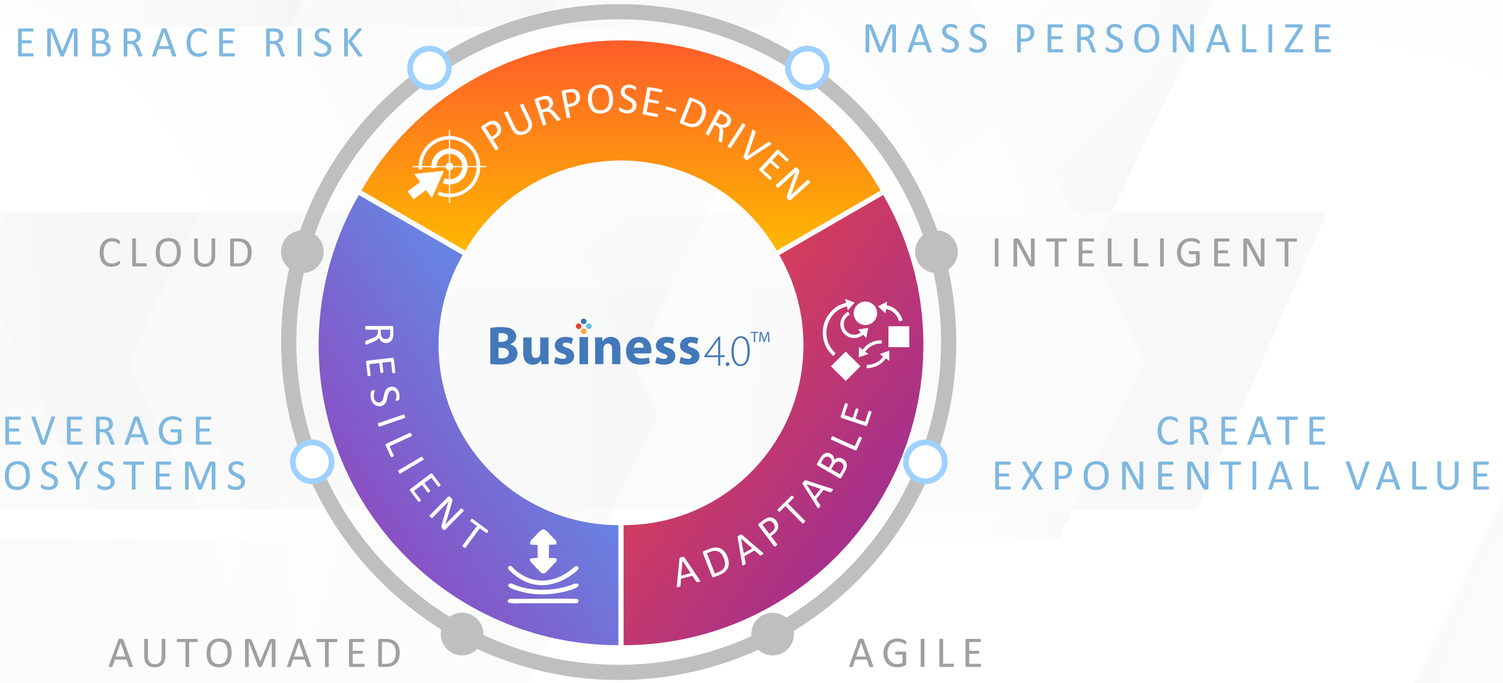

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Executive Summary

Disruptions caused by COVID-19 have posed severe supply chain challenges for manufacturers that need to be addressed on a war footing. Problems have been compounded as movement restrictions have constrained quality checks and audits along the supply chain. These challenges need to be addressed as supplier reliability is key for manufacturing and business efficiencies in times of crises.

Ensuring supplier reliability through quality assurance, supplier performance improvement, and strategic cost management can transform supply chain management. These can assure uninterrupted incoming supplies, compliance to requirements, effective checks on quality of products and services, and standardized processes resulting in improved productivity. Performance reviews can help enhance supplier capabilities, lower cost of order replacements, and minimize product quality and compliance issues.

However, ensuring supplier reliability can prove to be challenging in normal times, and more so in a crisis situation. Manufacturers sometimes deal with thousands of suppliers — a consumer products major can have as many as 75,000 suppliers.[1] In addition, quality and compliance requirements in global operations require complex audits and checks across multiple geographies and varied regulatory requirements.

Leveraging digital communication tools, augmented reality, video surveillance and AI-driven solutions in combination with deep contextual knowledge of the industry can bring exponential value in supply chain management and towards driving long-term business growth.

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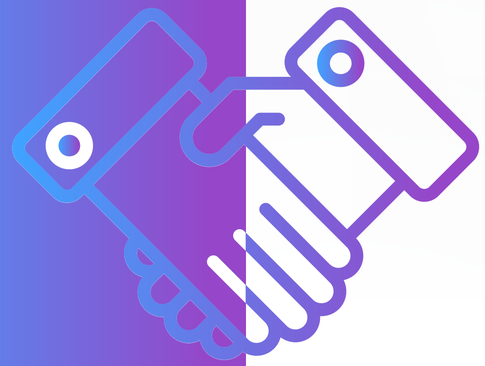
[1]https://www.forbes.com/sites/jwebb/2018/02/28/how-many-suppliers-do-businesses-have-how-many-should-they-have/#4ec9d2ca9bb7



Supplier Reliability is Key to Supply Chain Efficiencies

Imagine this scenario in COVID times. A consumer goods company with a large portfolio of hygiene products, faces a tall task – demand for its hand sanitizers has shot through the roof. Market forecasters put the spike at 600%.[2] While this presents an opportunity, producing and distributing hand sanitizers involves multiple challenges. First is to ensure supplies/inventory of ethyl alcohol, isopropyl alcohol, hydrogen peroxide and glycerin. Then comes arranging and assuring participation of external stakeholders such as packers and labelers and sub-contract manufacturers. For vendors based in countries with trade restrictions, alternatives need to identified on an urgent basis. Moreover, it is critical to ensure quality and manage costs all along the supply chain – that is to ensure supplier reliability. From selection of suppliers to drafting of supplier quality agreements with hundreds of vendors based in different countries – the entire process will have to be done remotely, given travel restrictions.

[2]https://www.businesswire.com/news/home/20200605005193/en/Hand-Sanitizers-COVID-19---COVID-19-Impacting-Demand

Manufacturing in a globalized world is dependent on supply chains and, in the current crisis, many companies are being forced to rethink and transform their global supply chain models. Some of the triggers include:

Demand compression in some areas and growth in others requiring jacking up of supplies

New sourcing demands as companies repurpose production lines to produce essential goods

Resource crunch to address sourcing and procurement activities

Quality stress in upstream supply chains posing new risks to availability of quality material; substandard material getting the nod due to urgency and shortages

Potential long-term impact to export and import-dependent supply chains

Addressing these challenges require interventions at various levels and ensuring supplier reliability has emerged as a priority area. There are two key aspects to supplier reliability – quality assurance and cost management. These are about ensuring quality products are delivered at an optimum price and on time.
Some managers plan to tackle supply chain bottlenecks as and when they happen, however a proactive approach with a clear strategy goes a long way in managing risk and optimizing supply chain efficiencies.

Three Touch Points of Supplier Quality Management

Ensuring quality in supply chain involves checks and processes at various stages of the value chain. It is a continuous process and goes much beyond selecting the right vendors.
In fact, the entire process can be categorized under three touch points – onboarding, ongoing quality assurance and performance management (see Figure 1).

Figure 1: Quality assurance requires interventions at three levels

Supplier Onboarding

To understand vendor capabilities to support a company's requirements, enterprises should develop an assessment framework across multiple scenarios such as manufacturing existing products with existing suppliers; new products with existing suppliers; existing products with new suppliers; or new products with new suppliers. A scenario-based assessment gives a more accurate assessment of a supplier's strengths and weaknesses over the long term.

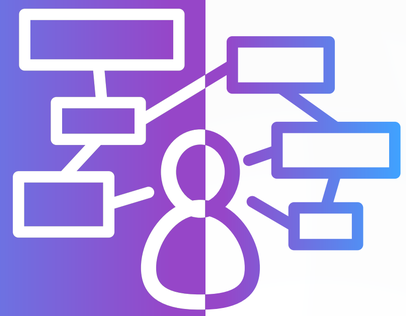
Assessments can be further classified into light, medium or heavy. For example, a quality concern raised about an existing product would require a 'light' quality assessment of existing supplier, while onboarding a new supplier for a new product will require a 'heavy' assessment. Advanced remote digital assessment techniques can cover critical aspects of design and quality for all scenarios and categories of assessment.

Ongoing Quality Assurance

Supplier reliability requires ensuring quality and on-time delivery of the products from global suppliers to enterprises. A key step in moving towards remote assurance is establishing supplier quality agreements which list all requirements the suppliers need to meet. These could include specific checks required, packaging standards, dispatch conditions, documentations, and even inspection schedules. Once a proper agreement has been worked out, it forms the basis of remote inspections and audits using webforms and digitalized workflow management.

Establishing supplier quality agreements for 700 plus suppliers across eight countries helped a medical devices conglomerate ensure supplier reliability. It set up standard processes, established a framework to support all activities and review quality checks remotely. When the pandemic struck, the company was able to manage its supplier network and the risks it posed.

It is also essential to revisit supplier quality agreements or establish new ones to mitigate new risks, to address customer complaints or deal with a disruption such as the current pandemic situation. New checks can be added – say to meet a new regulatory requirement -- or existing ones can be dropped as required.

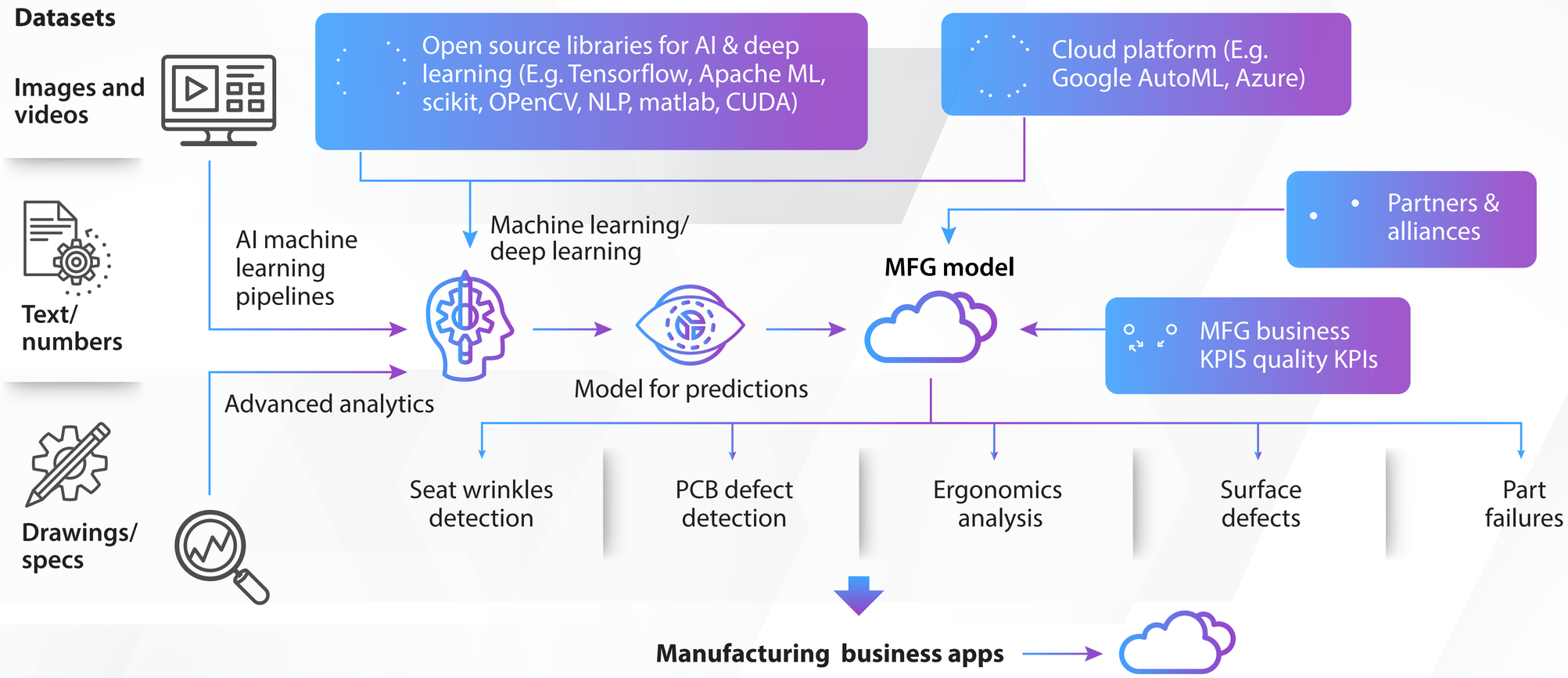


Supplier inspection and manufacturing status can be monitored remotely with minimal onsite presence for validating critical requirements. The entire inspection process can be digitalized using augmented reality, video inspections, IoT-powered sensors, etc. In fact, digitalized inspection can also be carried out in real time. Suppliers can share data on critical-to-quality (CTQ) and process parameters through online webforms which can be reviewed by qualified inspectors before issuing clearance to ship the products.

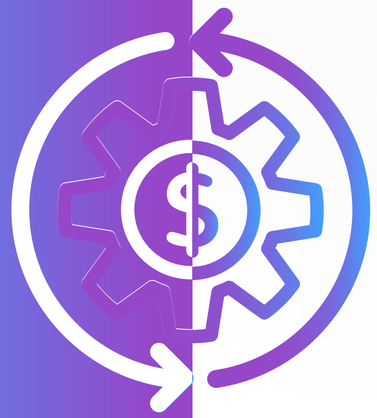
Supplier audit is another process for supplier reliability that can be digitalized by moving from onsite audits to remote desktop audits. Qualified auditors use audio/video conferencing to validate objective evidences to identify any gaps and work closely with suppliers to close the identified gaps, and to ensure compliance to quality management system (QMS) requirements. The entire process can be digitalized and the status of audits can be tracked to meet the desired audit schedule requirements.

Apart from desktop audits, companies are also opting for AI-based cognitive inspections to overcome the challenges posed by restricted human movements. In fact, cognitive quality assurance has many advantages over manual processes. IoT-based digital twins can replicate processes and provide accurate benchmarks to measure productivity and standards. Cognitive quality assurance across the value chain -- from data collection through to predictive analysis and related recommendations -- is gaining currency in remote supplier quality assurance.

Use Case: AI-enabled Cognitive Quality Assurance



Cognitive quality assurance uses a combination of video surveillance, IoT, advanced analytics and machine learning algorithms to inspect, identify defects and analyze impact. In the above case, cognitive inspection of car seats being supplied helps spot defects that might have escaped a manual, onsite check.



Supplier Performance Management

Monitoring overall supplier performance on a continuous basis and identifying improvement actions are important aspects of ensuring supplier reliability and enhancing business competitiveness. Supplier performance needs to be measured against the targets set in quality, cost, delivery and service. A Six Sigma framework coupled with a DMAIC (define, measure, analyze, improve and control) protocol is necessary to improve supplier performance. This process too needs to be digitalized for standardization and effectiveness.

A global communications hi-tech major was able to reduce quality issues significantly by deploying Six Sigma DMAIC framework for performance checks at supplier locations in the US, Mexico China and Thailand, combined with remote monitoring.

Strategic Cost Management

In the current pandemic situation, enterprises are looking to ensure cost effectiveness of supplies from existing and new suppliers. Strategic cost management that validates supplier costing helps in monitoring costs and prevents surprises at a later stage. Cost modeling and cost benefit analysis are key tools in this process -- and it can be managed remotely leveraging digitalized platforms.

Complex product requirements and huge product variance require a thorough view on the build-up for costing. For enterprises where purchased components and services account for over 60% of overall product costs, knowledge of the price structure, cost drivers and external manufacturing processes becomes increasingly important. Harmonized costing methodology and enhanced knowledge management in purchase price analysis is critical for effective negotiation and for identifying greater degree of cost saving opportunities. It plays a vital role in optimizing value in its procurement strategy.

Cost Management through Cost Modeling and Cost Benefit Analysis

Costing bill of material
Material weight, sizes, quantity
Bought outs
Manufacturing process

Cost data sheet
Raw material rates
Labor rates
Machine hour rates
Overheads, profits and other costs

Material cost
Scrap calculation
Raw material/purchased part cost calculation
Inbound logistics costs

Manufacturing cost
Manufacturing and assembly processes
Labor cost/conversion cost
Surface treatment cost

Overhead, profit, others
Geography specific %
Domain specific profits %
Rejection, warranty, royalty etc.

Cost compilation
Total cost compilation
List all assumptions

Cost validation
Review by costing lead & SME

Cost model

How cost is tracked

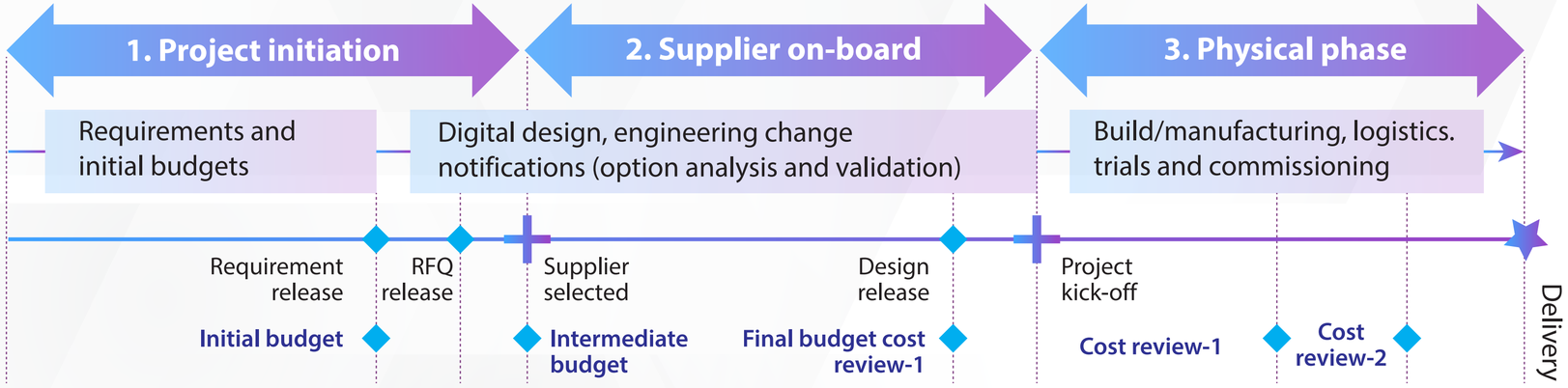


Figure 2: Cost modeling and tracking for supplier reliability

Enablers

- Costing templates
- Labor-machine hour rates/ raw material database
- Industry trends
- Experts
- Supplier market intelligence
- LME trends
- Labor index
- Customer database

Cost modeling helps estimate a 'should-be' cost by factoring in cost of raw material, labor and material, etc. (see Figure 2). Transparent and accurate cost estimation with integrated knowledge, cost models and cycle time calculators are integral to the process.

Manufacturers need to monitor supplier costs in the ever-changing scenario through regular cost estimations. Automated costing templates can be used for quick turnaround to enable strategic business decisions to reduce overall impact in the current situation.

The 'should be' cost estimate forms the basis of a cost-benefit analysis that provides a holistic approach towards effective project cost management. Having a cost estimate allows enterprises to investigate its own supply chain while keeping the final total costs within the prescribed budget.

A digitalized framework to monitor project cost against the allocated costs is the next step in strategic cost management. In the current pandemic situation, there could be changes in costs due to various reasons like use of alternative material, increase in price of raw material or accessories, rise in the cost for skilled labor, and so on. Monitoring the cost behavior during the entire life cycle of the project and facilitating discussions between supplier and customer stakeholders lead to identifying actions required for gap closure. Digitalization helps in remote monitoring and allows quick actions to avoid cost overruns.

A strategic cost optimization strategy has the potential to reduce the costs involved by more than 15%. This approach has helped companies across industry verticals and this is becoming a key strategy for most CFOs and CEOs.

An auto major which deals with more than 200 tier 1 suppliers was able to meet the cost targets for their localization initiatives.

Recommendation

As businesses strive to get back into an operational rhythm in the wake of COVID-19, supplier reliability can prove to be a success factor. Companies should adopt digital technologies for remote quality assurance, performance management and cost optimization. This will enable scalable and real-time monitoring to ensure first-time right quality at the right price and at the right time.

About the **Authors**

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Raju leads the Sourcing Solution group and has successfully defined supplier reliability solutions for leading companies across industry verticals. He has been working in this field for 33 years, with 19 years in core manufacturing industry. Raju specializes in strategic sourcing assessment, localization initiatives, direct and indirect purchases, cost optimization programs, supplier quality assurance and management to create long-term value. He has been with Tata Consultancy Services since June 2006.

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Yogesh specializes in strategic sourcing, supplier quality assurance and development through supplier reliability, QMS, manufacturing and Six Sigma. With more than 25 years' experience in the field, Yogesh has successfully led several projects across different industry verticals in the areas of strategic sourcing to identify best sourcing strategies, and establishing global supply chains to ensure on-time delivery of quality parts along with substantial and sustainable cost savings. Yogesh has been working in TCS since June 2006.

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