CIPS KNOWLEDGE

Supply Chain Optimisation - SCO

Supports the need to deliver what the customer wants at the lowest overall cost and highest overall profit to your business.

This knowledge paper is supportive of Procurement professionals operating at Managerial level of the CIPS Global Standard

01 CPD HOURS

CIPS members can record one CPD hour

Supply Chain Optimisation

Definition

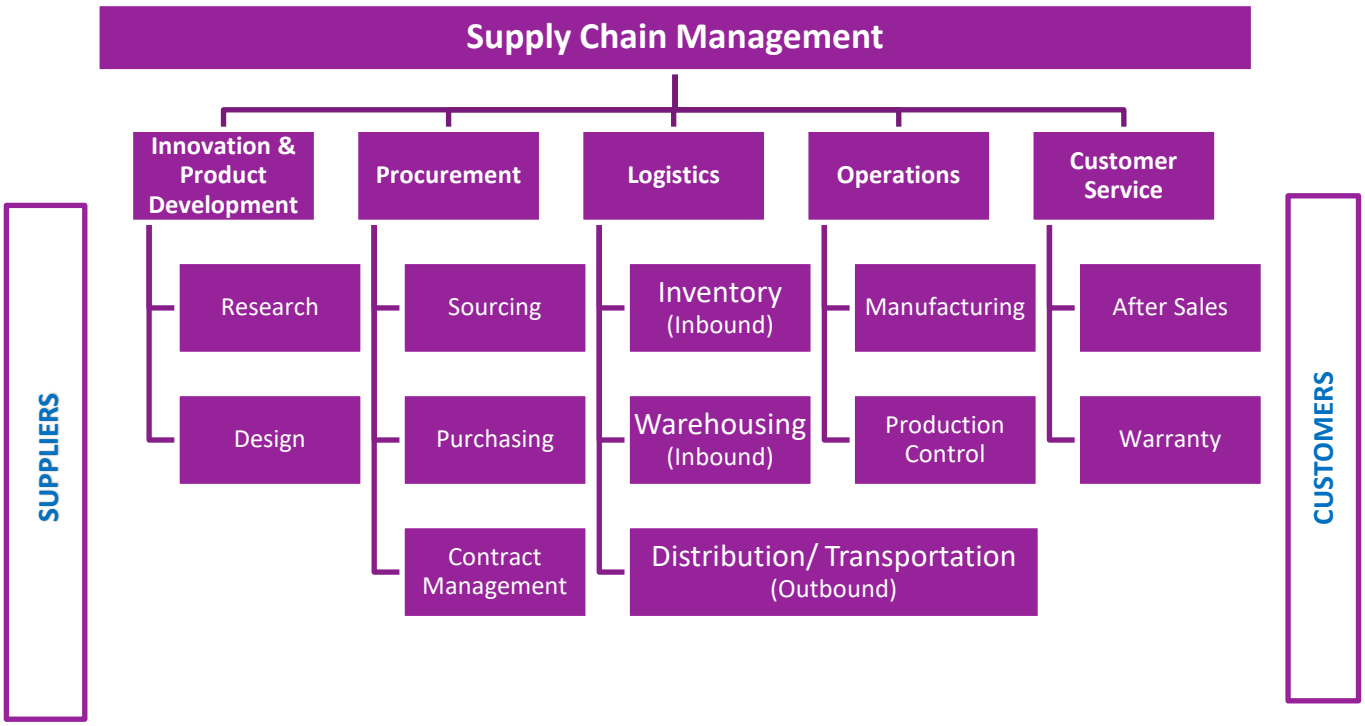
Optimisation – The action of making the best or most effective use of a situation or a resource, by maximising desired factors and minimising undesired ones.

Supply Chain Optimisation – The application of tools and processes to streamline an end to end manufacturing or production operation to reduce cost and increase profit

Working as a Supply Chain Manager tasked with seeking optimisation, you are trying to balance the need to deliver what the customer wants at the lowest overall cost and highest overall profit to your business. This means seeking out excess cost wherever it may sit in your Supply Chain process and reducing or removing it without increasing your risk or reducing your efficiency or the product availability to the customer.

Depending on the industry, supply chain costs can range from 10-20% of revenue. Focused supply chain optimisation can reduce costs by up to 25% which is a much larger opportunity than many other operational improvement initiatives. Some of these optimisation initiatives will be a quick win in cost reduction for the business, other may take a longer term strategic shift to realise the larger benefits.

The definition of 'Supply Chain' has come to mean the entire end to end process from suppliers through to customers and every direct and indirect process in between. Cost sits at every element of this chain. While invested cost can often bring about a reduction of risk or improved efficiency, it can also result in over-caution, dated approaches and lack of effectiveness at every level within the business. It is this thinking that optimisation initiatives intend to drive out.



The scope of the Supply Chain Management operation

The application of Supply Chain Optimisation techniques

Companies may choose to introduce supply chain optimisation programmes,

- Where there has been a merger or acquisition and the different companies need a system or process alignment.
- When as a result of the e-commerce revolution and the advent of omni-channel trading companies have bolted on direct sales capabilities without integrating them into other existing channels which can lead to disjointed processes and overall higher costs which an optimisation programme is intended to remedy.
- When financial results fall below expectations, an optimisation programme is seen as the answer to reducing costs, increasing profitability and retaining customers.

The classic first step in a supply chain optimisation approach has been to tackle inventory which is such a large contributor to cost. Many companies try and forecast future inventory demand as accurately as possible by applying statistical techniques based on historic demand and predicted future events. Unpredictability in demand is managed by setting safety stock levels. Methods such as Standard Deviation and Means Absolute Deviation are often used to calculate safety stocks. Optimisation solutions are linked to the company's replenishment systems so that orders are automatically generated to maintain the desired stock profile. The algorithms used are similar to those used in making financial investment decisions.

Other process approaches to optimisation begin by understanding what your supply chain looks like now, its successes, its weaknesses, its gaps. You can begin by accurately mapping your current procurement, inventory control, customer services and logistics team processes. The next stage would be to include suppliers in the

as-is mapping, going down to tier two suppliers and then include freight, warehousing, productions and delivery. The map will tell you how much time and how much cost is built into your supply chain and in what areas. You can then assess and prioritise which areas to tackle first to help achieve the goal of getting your product to your customers when they want it at the lowest cost to the business.

Suppliers will have to be reviewed and potentially business moved. Some of your activity may be best done by a third party provider to increase expertise and reduce cost. Freight operations, logistics operations and information technology providers are ideal candidates for partnering or outsourcing to reduce cost. A review of talent may be appropriate. Do you have the skills and capabilities to deliver the optimal performance? Are six sigma lean and other process optimisation tools operating as standard within your company? Is your computer and information support infrastructure up to standard and providing the analysis and reporting at a strategic level that drives change across all areas of the business?

Every link in the supply chain costs money and takes time and if you can improve the time it takes to move products to your customers then you can reduce the amount of money that process costs. Raising orders, holding and moving stock, maintaining vehicles, paying invoices and managing cash flow, warehouse overheads are all candidates for optimisation.

Areas of supply chain cost and opportunities optimisation:

Opportunities	Optimisation approaches
Mapping the supply chain	To improve the supply chain, understand the current structure and where the blockages and costs lie. An in-depth mapping process will expose these areas.
Improved business alignment	Align your supply chain to the organisational structure. Align your supply chain to organisational strategy and goals Align management resources to support the supply chain objectives e.g. people, information, technology, finance. Align suppliers with your supply chain goals through communication and collaboration.
Software support	Introduce mathematical modelling software to plot optimal inventory holding against customer demand. This can either be integrated in a central ERP system or run by an application service provider (ASP) as a bespoke service.
Improved processes	Introduce lean and agile approaches. Collaborative planning, forecasting and replenishment routines. Business process re-engineering. Outsourcing non-core activities to third party providers. Reduce manual processes e.g. Introduce block chain technology in invoicing and payments.
Pursuing specific supply chain optimisation opportunities	For example, improved order processing, reduced inventory, warehouse and storage management, freight handling, increased supplier collaboration, focused reporting and analytics, security, transportation and logistics, compliance and auditing, product size and packaging, innovative production approaches.
Waste reduction	Look at delays, bottlenecks, double handling, write offs and

	remove all these non-value adding activities.
Introducing measurement and Key Performance Indicators	Measure the impact of your optimisation approaches by use of Gross Margin on Inventory Invested (GMROII), Standard Deviation and Means Absolute Deviation on stock, Cash Flow indicators and Working capital measures.

Risks and mitigation within Supply Chain Optimisation

The balance between Supply Chain Optimisation and Supply Chain starvation is a fine line. How lean is too lean? How much safety margin should be built in? Should our optimised supply chain factor in some contingency to cover risks and constraints that might affect a global supply chain including spikes in fuel costs, material shortages, natural disasters and global political uncertainty? Or should this just be seen as a hidden cost that can be cut to the bone?

Perhaps the balance between lean and agile has gone too far. Perhaps we have become too lean and insufficiently agile. When a crisis hits, we find our finely optimised supply chains are too fragile and we are not able to move quickly enough to secure them or support our customers.

One optimisation blueprint does not last forever. It has to be continually amended and updated depending on business exigencies. Are most of our businesses this responsive to change?

Martin Christopher believes that the challenges to optimisation in the changing competitive environment are:

- **Turbulence and Volatility** in the marketplace which makes it hard to forecast how much margin to allow in inventory or in processes to cater for sudden fluctuations in supply or demand conditions.
- **The Globalisation of industry** has increased the length and complexity of supply chains and therefore the risk of unpredicted elements threatening the optimised process increases. The outcome of complexity in a supply chain is uncertainty and with that uncertainty comes the increased risk of error.
- **Downward pressure on prices** which is the aim of optimisation can bring the challenge of continually finding new opportunities for cost reduction when people and processes may already have been cut to the bone.
- **Customers in control.** Customers are more demanding not just of product quality but of service particularly in view of the omni- channel revolution. This is a cost growth area rather than a cost reduction opportunity.

Martin Christopher argues that these pressures can be countered with increased

- **Responsiveness.** Agility implies the need to move quickly to meet customer demand sooner. Because future demand patterns are uncertain, agility may be more important than traditional long term planning.
- **Reliability.** One of the main reasons why a company carries safety stock is because of uncertainty about the market or about a supplier's ability to meet a delivery promise. Significant improvements in reliability can only be achieved by re-engineering the processes that impact performance.
- **Resilience.** Resilient supply chains may not be the lowest cost supply chains but they are more capable of coping with the uncertain business environment.
- **Relationships.** Optimisation may result in a much needed reduction in a company's supplier base; however, companies are discovering the advantages that can be gained from seeking mutually

beneficial, long term relationships with fewer suppliers as a means to reducing cost and managing uncertainty.

Case Studies

A couple of manufacturing Case Studies:

Synchronised Delivery

QR or Quick Response is now the umbrella term for the information and logistics systems that combine to provide synchronised production and delivery. In order to reap the advantages of time based competition, it is necessary to develop systems and processes that are fast. By speeding up the processing time in the system, cumulative lead-times are reduced. This can then result in lower inventory and thus further reduce response times and reduce cost.

In a synchronous supply chain, the management of inbound materials flow becomes a crucial issue. In particular, the search for consolidation opportunities has to be a priority. It is perhaps not surprising that the emergence of synchronous supply chains as a management philosophy has coincided with the growth of third-party distribution and logistics companies specialising in providing an inbound consolidation service.

Nissan Motors UK process for receiving vehicle seats on its assembly line in North East England

Elapsed Time	Process Activity
0 hours	Painted body passes to trim line in Nissan Precise vehicle specifications of the next 12 vehicles transmitted to computer from Nissan seat suppliers Suppliers transfer information to picking lists Seat covers selected from range
1 hour	Covers prepared for assembly (in reverse order) Seat assembly from synchronised manufacture of sub-assemblies (frames, foams, finishers, plastic parts)
2 hours	Quality audit and load Delivery of seats to stock holding point by special purpose vehicle Stock to lineside
3 hours	Rear seats fitted followed by front seats (waiting stillage's returned to empty wagon) Delivery frequency now every 15-20 minutes

Source: *Logistics and Supply Chain Management 5th edition, Martin Christopher*

SMED – Single Minute Exchange or Die

The key to flexibility in manufacturing is not just new technology e.g. robotics. The main barrier to flexibility is the time taken to change from one product or variant to another. Typically this is called 'set-up time'. If set up times can be driven as close as possible to zero then the supply chain will be fully optimal and flexible responses to changing customer demand or market disruption presents no problem.

The Japanese have led the way in developing techniques for set up time reduction. 'Single Minute Exchange or Die', or SMED is the goal of many Japanese plants. Continuous attention by management and the

workforce is focused upon ways in which set-up times can be reduced. In many cases set up times have been reduced from hours down to minutes simply by questioning the conventional wisdom.

The marketing advantages that such flexibility brings with it are considerable. It means in effect the company can cater to the precise needs of multiple customers and their niche requirements which becomes a major source of competitive advantage.

A more unusual case study from the services sector, demonstrating the importance of optimisation outside the manufacturing sector.

Avaya

"Avaya" is a global force in business collaboration and communications technology, and not so many years ago, was operating what, by its executives' admission was a worst-in-class supply chain. That situation arose as the result of multiple corporate acquisitions over a short space of time. The company was suffering from a range of supply chain maladies, including a long cash-to-cash cycle, an imbalance in suppliers terms and conditions, excess inventory and supply chain processes that were inefficient and wholly manual.

After Avaya purchased Nortel Enterprise Solutions in 2009, the freshly merged company found itself loosely in control of an unstable and ineffective supply chain operation. Aside from having too many disparate and redundant processes, the company had multiple IT solutions, none of which provided a holistic view of the supply chain or supported focused analysis.

Avaya's senior management team realised that its technology solutions, which varied from being inadequate to inappropriate, were causing many of its problems. The various mergers and acquisitions had transformed Avaya into a different kind of enterprise and what it needed rather than a replacement for all the discrete systems was one solution to tie them all together.

In the end the company put its trust in cloud technology which was relatively immature at the time and migrated all processes onto one platform, which was designed to automate non-value-added-activities and integrate those critical to proactive supply chain management including: point of sale analysis, procurement analysis, supplier communication, supply and demand planning, inventory planning, inbound and outbound logistics planning. Of course the technology was merely an enabler. To transform its supply chain, Avaya embarked on a long term phased programme to standardise processes, initiate a culture change, invest in top talent, and implement a system of rigorous benchmarking and KPI tracking.

By making a conscious effort to lead the enterprise into new ways of thinking, between 2010 and 2014, Avaya improved inventory turns by more than 200%, reduced cash tied up in stock by 94% and cut its overall supply chain expenditure in half."

Source: *Logistics Bureau, 7 mini case studies: Successful Supply chain Cost Reduction and Management*

Downsides of optimised supply chains

The downside of optimised supply chains is that there may not be enough resilience when a crisis hits.

'Not Enough Room for Manoeuvre in Lean Supply Chains' Malcolm Harrison CEO, Chartered Institute of Procurement and Supply.

Source: Supply Management magazine March/April 2020 and Sept/Oct 2020

Malcolm Harrison, CIPS group CEO says, “The global pandemic crisis has shown that we may already be too late to build stocks of essential components. Mitigation strategies require planning and time to be enacted. For some businesses it appears it is already too late to put those mitigation strategies in place. We must look to our sourcing strategies and review what can change. For some firms there has been an excessive financial focus for too long – such as holding the minimum amount of stock from single source, low cost suppliers.

Opting for the absolute minimum working capital means events like this have a greater impact on supply chain continuity as stocks dry up and suppliers are unable to fulfil obligations. It is the responsibility of the supply chain manager to build in resilience through multi-sourcing or investing in other and perhaps local suppliers to deliver overall best value for the business.

There are many lessons to be learned from the pandemic to tighten up on good governance in organisations, to improve and processes and business continuity plans. We expect to see supply chains and sourcing strategies being redesigned with more of a focus on resilience and not just on achieving the lowest prices. We anticipate that organisations will start to shorten supply chains to build in more agility, perhaps hold more stock, spread their demand across multiple suppliers and even in-source some critical items or services. All this must be balanced with what looks to be a global economic downturn and a focus on value must continue.”

Author

Susan has worked in corporate industry within procurement for many years, undertaking everything from expediting, through contract negotiation, to strategy development and large scale change management initiatives.
She is now focusing on project procurement, commercial training, coaching and technical authoring through her own business.

Susan is a great contributor to CIPS and has been involved with CIPS through her chairmanship of the Birmingham branch and participation in the annual Negotiation Challenge events.

Susan Randall (BA FCIPS Chartered)

LinkedIn

Further Reading

Logistics Bureau : https://www.logisticsbureau.com/7-mini-case-studies-successful-supply-chain-cost-reduction-and-management/

Logistics and Supply Chain Management 5th edition by Professor Martin Christopher