

SUPPLY CHAIN NETWORK MANAGEMENT

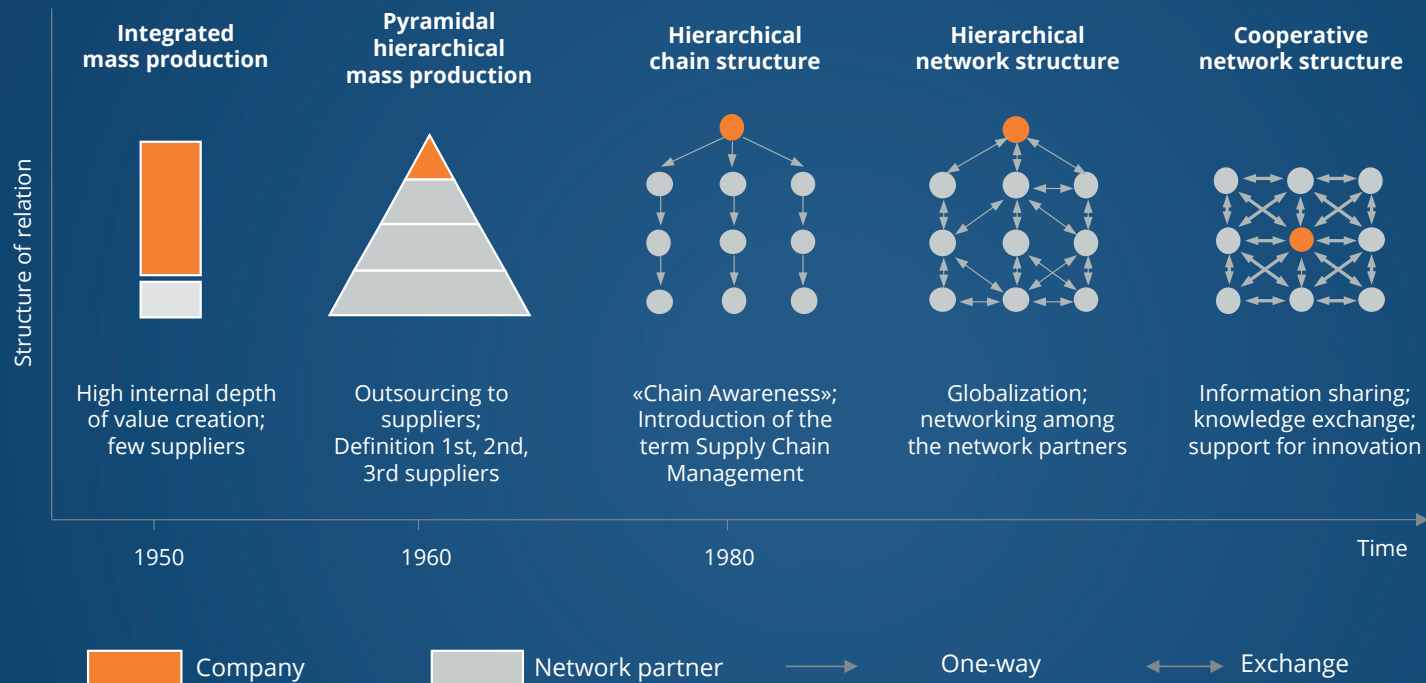
**RECONFIGURATION OF SUPPLY CHAIN
NETWORKS – BOTH GLOBAL AND LOCAL**

STAUFEN.
i n o v a

INTRODUCTION

Optimisation measures generally concentrate on internal processes. By contrast, a company's own value creation network, made up of increasing numbers of partners, is rarely the focal point. This is a significant omission, as in crisis situations it becomes evident that numerous companies need to reconfigure their supply chains. In this context, our approach is holistic: classic Supply Chain Management becomes Supply Chain Network Management.

Current forms of industrial production are based on complex, multi-level supply chains. They enable unprecedented efficiency and productivity. But, they are also prone to disruption. Low vertical integration, just-in-time logistics with ocean transportation lasting weeks and regional concentrations of suppliers reflecting cost criteria require seamless processes without risk.



After the crisis: Reconfiguring the supply chain

A global pandemic featuring quarantines, curfews and shut-downs in huge parts of the economy – up to a few months ago all this seemed like material for Hollywood. But it became reality. The Corona Crisis 2020 has focused attention on risks and uncertainties within many companies. Their market environments have crumbled on both fronts: supply chains no longer function and sales markets are inaccessible. Industrial companies in all sectors are confronted with a new challenge: the need to reconfigure their supply chains in order to detect potential disruptions early, minimise risks and manage the consequences of crises.

From the Supply Chain to the Supply Chain Network

Companies rely on extensive and frequently worldwide networks of suppliers to generate their value creation. Numerous manufacturing sites, broad product portfolios and customer-specific production increase the complexity of supply chains and the risk of disruptions.

Add to this the entire sales side, often involving global distribution. In some cases, this is also done through several stages with various organisational units and trading partners, right through to the end customer. The same applies for the suppliers. They too have dedicated suppliers whose products can impact their own products and those of their customers.

Nowadays, the growing complexity and susceptibility to crises of networked supply chains clearly indicates that traditional supply chain management is no longer sufficient. A holistic view is essential: Supply Chain Network Management (SCNM) that also incorporates risk management.

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WHAT IS SUPPLY CHAIN NETWORK MANAGEMENT?

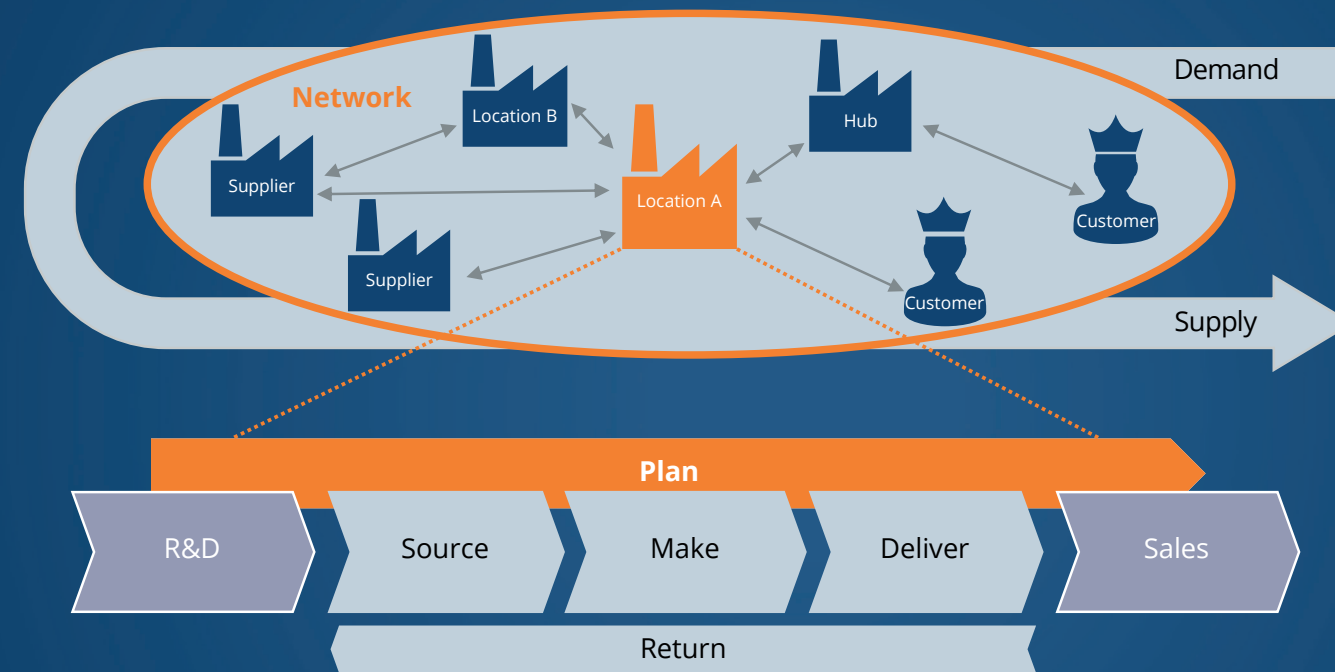
The low levels of vertical integration that predominate nowadays mean that a significant part of the value creation chain is transferred to suppliers. This increases their importance. They are accorded the status of business and development partners who make an independent value contribution to the products and services of their customers. The consequence: competition no longer takes place between individual companies, but between entire networks.

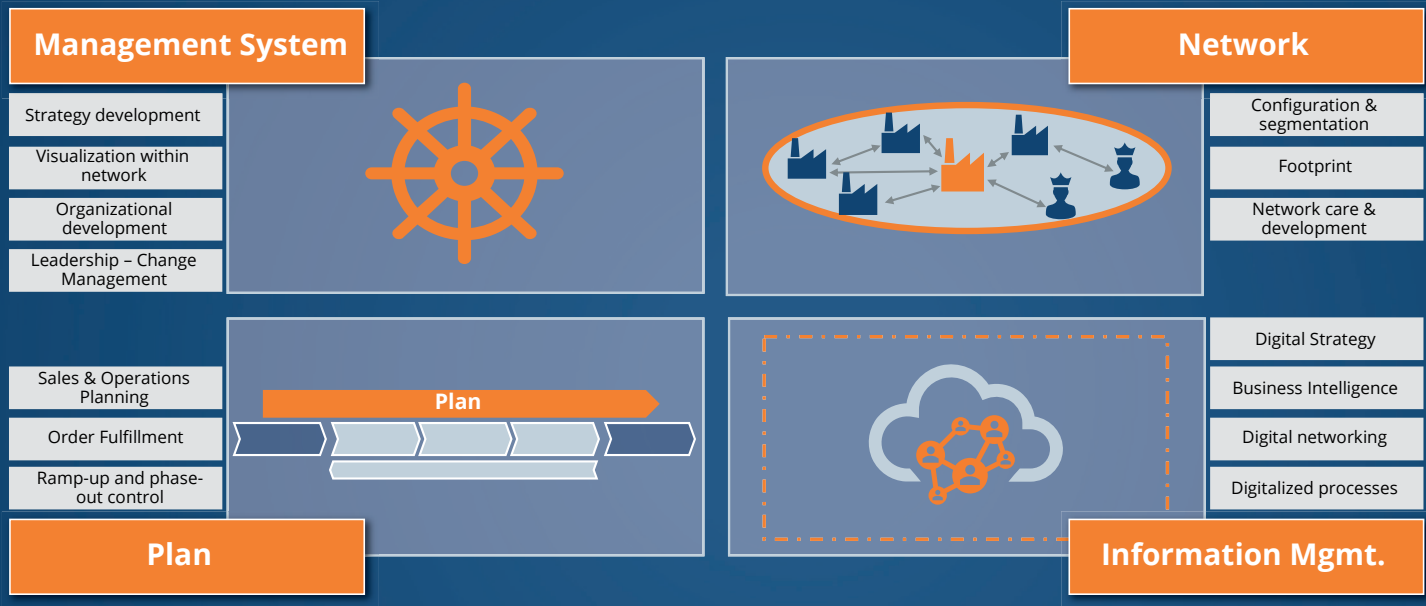
To survive, companies must network their pool of suppliers both between each other and with themselves. On the one hand, this involves intense communication, but on the other it also means the networking of value and data streams. Ex-

change of information among themselves, high degrees of transparency and cooperation between individual teams is becoming far more important than the issue of which supplier is particularly cost-effective.

The primary task of Supply Chain Network Management: to make the entire network and the cooperation of the individual network partners more efficient. The winners are supply chain networks that are ideally and agilely oriented towards the customers. Success, however, calls for a number of criteria to be met. All network partners need:

- Short Time2Market
- High ability to respond
- Short processing times
- Cross-location process standards,
- Lowest possible inventory levels
- High degree of transparency,
- Reduction of communications and media disruptions
- Abandoning the silo mentality
- End-to-end planning



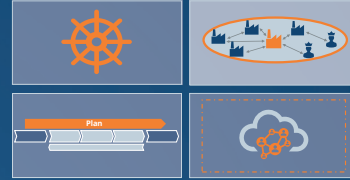
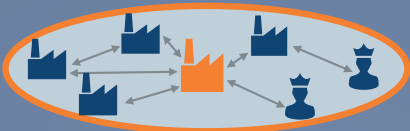


2 THE FOUR DIMENSIONS OF SUPPLY CHAIN NETWORK MANAGEMENT

To fulfil these criteria, Supply Chain Network Management focuses on four central dimensions: network, management system, IT systems and plan.

- The **network** is the configuration of different actors, such as production plants, hardware and software developers, delivery hubs, suppliers and their subcontractors as well as logistics service providers, sales and distribution partners and even the end customers.
- **Management systems** are the organising force in a supply chain network. They involve aspects such as strategy and organisational development or network-wide change management.
- **Plan** here is essentially understood in terms of Sales & Operations Planning (S&OP) and Product Lifecycle Management (PLM). This task requires an end-to-end perspective in order to achieve optimal results.
- **Information management or IT systems** provide the applications and digital tools without which a supply chain network cannot be built: digitization facilitates networking

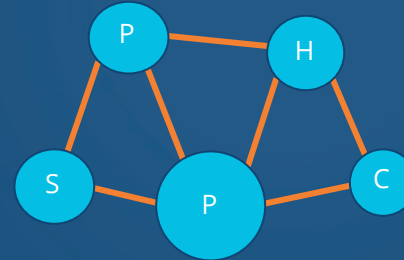
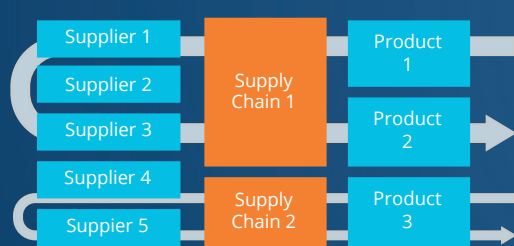
Network



Configuration & segmentation

Footprint

Network care & development



Dimension 1: Network

Normally, a supply chain network is perceived from the position of the company itself. This raises the question of how the company designs its supplier and distribution network. When doing so, it needs to take its framework conditions into account.

The reality is that complexity is increasing for all companies. The reasons are: ever faster innovation and development cycles, trends towards shorter delivery times and increasing product variance and individualisation, the emergence of disruptive business models and greater market volatility.

These complexity drivers require a stable network of partners, who of course are subject to the same influence factors. As a result, the demands on management of the supplier

network increase. Processes and interfaces are defined, controlled and optimised on an inter-company basis. In addition, especially in B2B markets, such networks also include customers who are also actively involved in issues such as product development, quality or sustainability.

In many cases, such networks do not exist already, but need to be established. This process includes the selection of the right partners, and structuring the relationships between them. To that end, companies should focus on four important aspects:

1. Configuration and segmentation: Companies select network partners according to their performance in terms of specific products or orders. Skilful segmentation of the network, i.e. its breakdown into related «subnetworks», limits disruptions to the supply chain: the different supply routes should not hinder each other. Companies must also keep an eye on the supply chains of their suppliers. As a result, networks often have hundreds to thousands of supply flows and companies must therefore develop the ability to quickly

adapt important sections of their value-creation networks to new objectives. As business objectives evolve, the significance of individual supply flows or network partners can change dynamically.

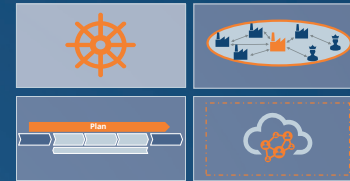
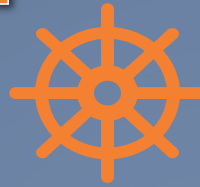
2. Footprint: Selection of the appropriate network partners needs to take a number of aspects into account, for example the proximity to the company's own locations. Conversely, new locations can be established according to the proximity to suppliers. Problems of allocation and distribution must also be considered when «designing» the supply chain network. Network partners have different priority levels within the network, which are defined according to the importance of specific products. Within the company's own network, value flows should be optimised and default risks minimised

so that in crisis situations, production can continue and ongoing customer services are guaranteed. Business-critical dependencies on suppliers arise from their share of deliveries, but also from their locations. For example, concentrating suppliers in one region can lead to supply chain disruptions more quickly than a broader-based regional distribution concept.

3. Order fulfilment: Order control within the SCNM is carried out across networks and must take the different decoupling points into account. Mass production of standard products (MTS = Make to Stock), for example, requires differently organised supply chains than dedicated machine construction (ETO = Engineer to Order) or contract orders (MTO = Make to Order). Consequently, companies must organise cooperation with their network partners in the most suitable manner.

4. Network care and development: A supply chain network cannot remain static. It must be steadily expanded to accommodate new or alternative suppliers. Distribution channels and sales organisations need to be continuously adapted to changing customer needs. Moreover, the network partners must be capable of developing themselves further. All this requires regular digital and personal communication.

Management System

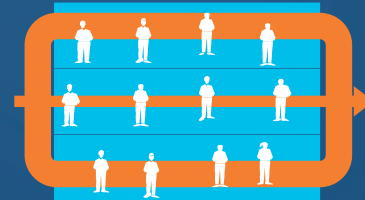
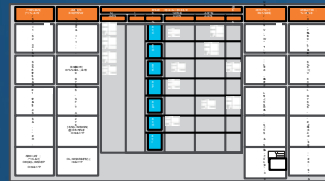
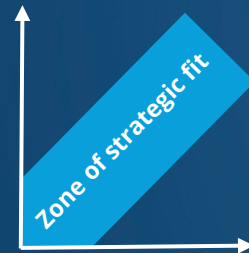


Strategy development

Visualization within network

Organizational development

Leadership – Change Management



Dimension 2: Management systems

The term management systems highlight the fact that supply chain networks must be managed, controlled and strategically developed across the board. This task involves four decisive factors:

1. Strategy development: The strategy for building up a supplier network is dependent on the overall corporate strategy: it derives from it. If it is not clear from the outset which direction the partners wish to take, this will lead to discrepancies and friction. Obviously, companies with different strategies are not an ideal match. For example, a company with an explicit innovation strategy needs correspondingly innovative network partners.

A further important aspect of strategy development is the implementation of risk management. Each company must identify in advance all «knots» in the supplier network that could create a risk. Examples include regional concentrations of key suppliers, the lack of alternative suppliers for vital primary products and raw materials, or unstable communication channels between individual business partners.

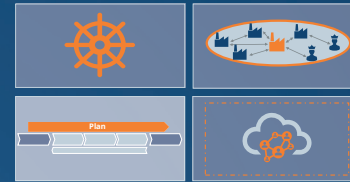
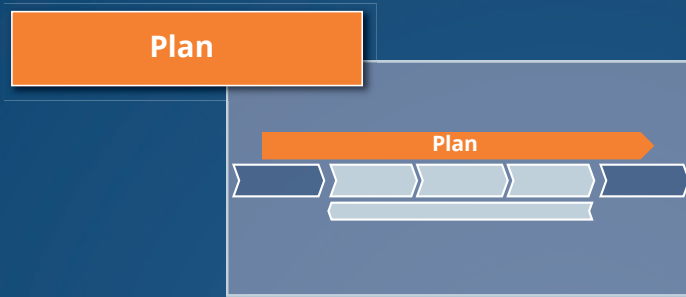
Additionally, there is a diversity of external risks that must be taken into account when configuring the supply chain network: for example, the political and social stability of a country, long-term climate trends or unforeseeable situations such as natural disasters or global pandemics. It is not possible to take precautions against all risks, but companies should establish procedures for early warning and response preparation. The risk management of any supply chain network

must be integrated into an overall business continuity management concept.

2. Visualization: Just as in a sole proprietorship, management dashboards are important for the implementation and control of the strategy. Network oriented KPIs are essential. They are no longer oriented towards the focus company, but aggregate and cumulate selected performance parameters.

3. Organizational development: Certain structural elements such as procurement or logistics of the individual companies should migrate to the network level. In this way, duplicate functions and roles should be avoided to reduce areas of friction. Another option is to set up pooled purchasing for standard products, where it is highly likely that costs can be reduced even further.

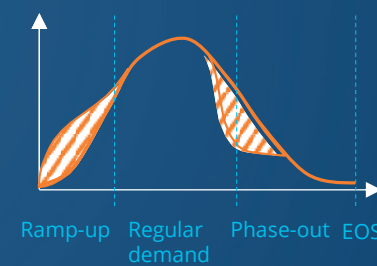
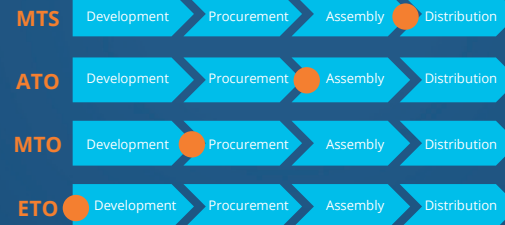
4. Change management: Setting up and ongoing development of a supply chain network brings with it more or less pronounced changes within the individual companies: processes are adapted, interfaces defined, roles and functions evolve, the management culture adapted. This is where coordinated change management is crucial for uniformly implementing organisational and process changes across all companies, while gaining the cooperation of the personnel of all the network partners.



Sales & Operations Planning

Order Fulfillment

Ramp-up and phase-out control



*MTS = Make to Stock; ATO = Assemble to Order; MTO = Make to Order; ETO = Engineer to Order

Dimension 3: Plan

In detail this involves the planning of the entire manufacturing and sales processes, control of the product life cycles and interdisciplinary cooperation between different planning instances within the network.

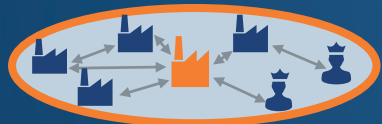
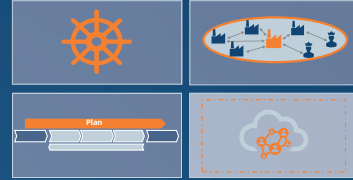
1. Sales & Operations Planning (S&OP): Sales planning and the planning and control of the process chain are only optimally effective if they are operated across networks. When this is achieved, demand and capacities throughout the entire network are harmonised. Here, the coordination effort is significantly higher. Each network partner must coordinate its own S&OP with those of all other members. The process chains should form a continuous value stream.

2. Ramp-Up and Phase-Out Control (phasing in and out products): The same coordination requirement applies to the lifecycle of both products and services. Coordination of the individual phases prevents disruptions in the supply chain or

overproduction. Here, the network needs comprehensive Product Lifecycle Management (PLM).

3. Interdisciplinary Planning: An important requirement for successful supply chain network management is the coordination of different functions within the network, e.g. procurement, R&D, production or marketing. All these functions must share information with each other across the network in order to fulfil their respective tasks within the defined time frame.

Information Mgmt.



Plan

IT as business enabler

Information flow

Material flow

Value flow

Digital Strategy

BI

KPIs
Visualization
Consolidation
Big Data

Digital network

IT overall architecture
System integration / Partner
Master Data Management / Integration data
Internet of Things

Digitalized processes

Organization und processes
Applications and systems
Infrastructure
Service Level Agreement

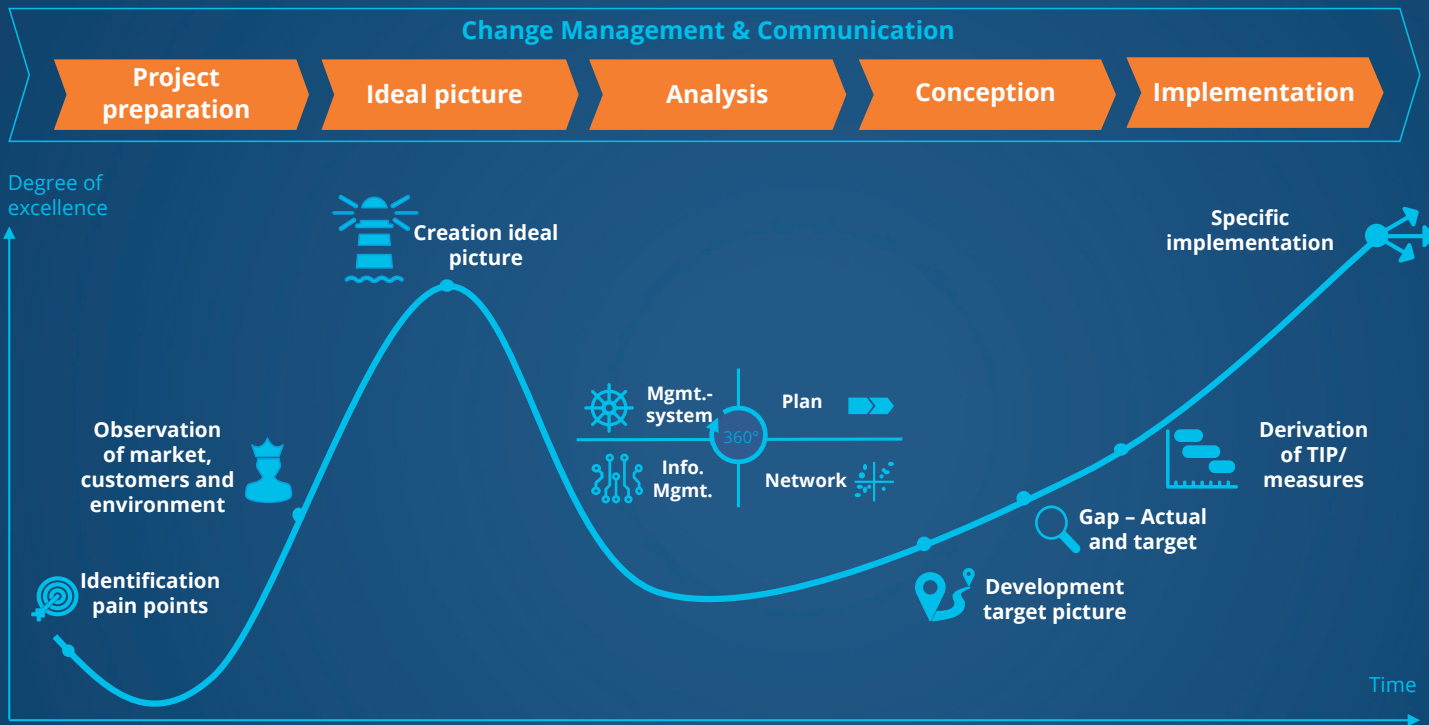
Dimension 4: Information Management / IT Systems

IT systems form the basis of supply chain network management and are vital to enabling the entire network to be set up and operated. To do so, companies need a modern IT infrastructure comprising three types of IT systems. Each focuses on one of the three aspects: management systems, network and plan.

1. Digitalized Processes / IT Applications Landscape: They form the fundamental infrastructure comprising CRM, PLM, ERP, Process Automation and further applications.

2. Digital Networking: In a supply chain network, the number of interfaces should be kept to a minimum to avoid inefficiencies. This requires both an overall IT architecture and the integration of the network partners' different systems and IoT data - including master data management.

3. Business Intelligence (BI): Data analyses lead to strategic decisions based on aggregated and cumulated KPIs. This includes the consolidation of such data and their visualisation. An important aspect is big-data-suitable applications, as the amount of data in a supply chain network can grow significantly.



3

IMPLEMENTING SUPPLY CHAIN NETWORK MANAGEMENT

Normally a company is not only integrated into one single linear supply chain. As soon as several suppliers and customers and an extensive product portfolio are involved, a multi-dimensional network inevitably forms. In larger corporations, this does not necessarily have to mean external companies; the complexity of a supply chain network is also evident within the organisation.

Problems arise due to low transparency, lack of communication and cumbersome delivery channels, even between subsidiaries that supply each other. No matter whether they are external companies or subsidiaries: in either case the need to actively manage this network soon arises. In practice, it immediately becomes clear that a supply chain network must be set up in a superordinate and holistic manner; otherwise too many inefficiencies are created.

For this reason, it makes sense for a company to introduce active supply chain network management with an overview covering the entire network. This process will be supported by Staufen.Inova Management Consultants, who recommend a three-step approach:

1. Analysis: A realistic review of the current status is important. In this phase questions such as: What significance do the individual network partners have for us? Are there already existing interfaces or do they first have to be created? Are our processes and the IT systems supporting them able to

guarantee intense communication and high transparency? Is our management culture geared towards the management of independent partners?

2. Conception: Supply Chain Network Management is not a matter of course. Companies must first develop a vision that takes key strategic decisions into account. Typically, the network must be aligned with a specific product strategy, for example innovation, market or cost leadership.

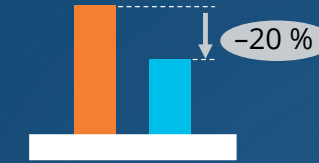
3. Implementation: The introduction of comprehensive supply chain network management is a highly complex task that also impacts the individual network partners - everyone must pull together. It is important that the four dimensions mentioned (network, plan, management systems, IT systems) are implemented in concert with each other.

To ensure that the introduction of supply chain network management is successful within a manageable period of time, companies should set priorities. For this reason, the analysis

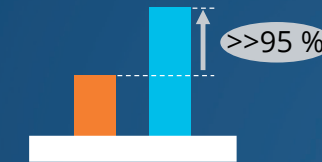
phase also includes identifying the most important «pain points» in order to subsequently assign greater priority to them during the design and implementation phases. In this context, it makes sense to focus first and foremost on the segmentation of the network and its transparency.

Through supply chain network management, any remaining optimisation gaps among all companies within the network can be closed. This allows end-to-end lead times to be reduced by as much as 20 percent and supply chain costs by 10 percent. In return, delivery performance and flexibility in the face of demand fluctuations are significantly improved. Last but not least, this leads to increased revenues as «lost sales» decrease.

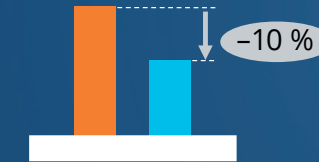
End-to-End lead time



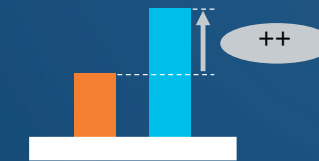
On time delivery
(On Time In Full)



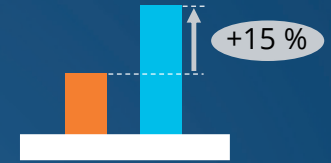
Supply Chain costs



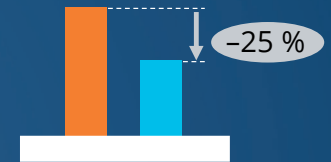
Transparency within
company network



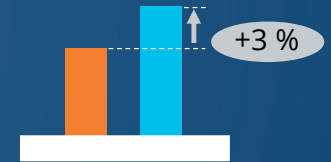
Flexibility to meet demand
fluctuations



Inventories in
network



Sales increase
(reduction of lost sales)



SUMMARY

Supply chains are increasingly developing into multidimensional, complex and global value creation chains. As such, they reach well beyond the classic understanding of purchasing, production, logistics and distribution. In future, competition will be between entire networks, rather than between individual companies.

Consequently, mastery of complex value creation chains will become a significant success factor. The winners will be supply chain networks that are ideally and agilely oriented towards customer needs. Individual network partners will function like gears that mesh perfectly. To ensure this success, information and data need to flow and maximum transparency must be achieved.

In the domain of Supply Chain Network Management, the approach of Staufe.Inova is to support companies across all phases from strategy to implementation. We help to optimally align networks with continuously changing fundamental requirements and operate them confidently through transparent management systems. Companies strengthen their future viability when they create networks with all key partners in the value creation chain.



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