Arthur D Little

Operations Management

Performance Excellence Networks

Solving the Global and Local Operations Footprint Puzzle

Content

Authors

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"In the long history of humankind (and animal kind, too) those who learned to collaborate and improvise most effectively have prevailed".

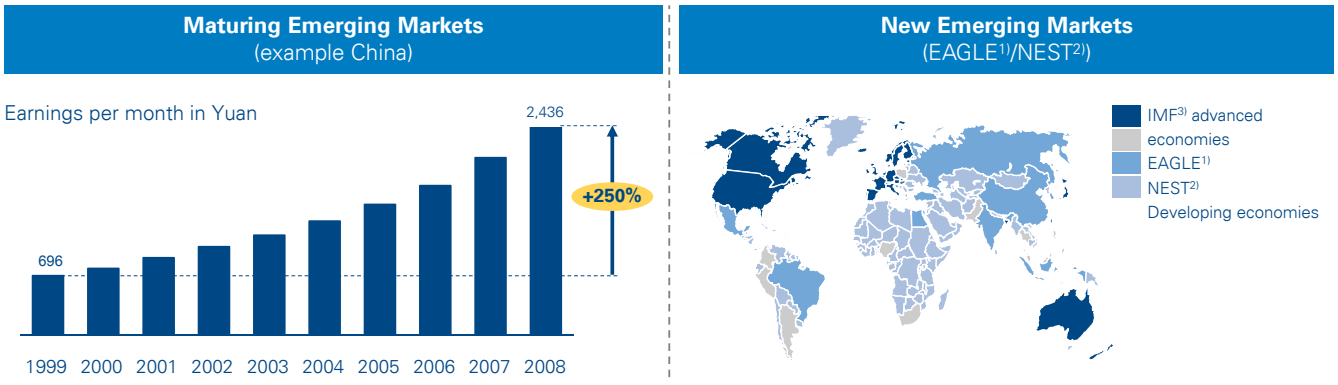
What Charles Darwin realized in the 19th century holds even truer today. Increasing worldwide and local requirements are driving regular adaptations of global operations networks neglecting a comprehensive optimization. The result is a complex footprint puzzle of not focused and unaligned sites with ambiguous roles and competencies limiting operational flexibility. Hence, to prevail in rapidly changing market environments a global network must tackle the local and global perspective simultaneously: Companies should establish a focused, open as well as effectively networked setup enabling continuous transformations of the global operations footprint while improving local performance levels continuously.

Mega trend I: Maturing of Emerging Markets

Today's business environments offer several current and upcoming challenges that hinder smooth operations in global networks. Especially two **mega trends** show a high influence on the current performance levels and complexity of global companies and describe contemporary and upcoming challenges.

The environment and competition in emerging and low cost markets has been globally changing and will develop further. Current emerging markets are maturing and catching up to the mature markets quickly. This development yields increasing local costs (especially labor) and the rise of strong local players challenging the global companies' local success. The wages in China for example have increased by 250% percent within as few as 10 years and this trend is continuing (see Figure 1). The local sites cannot survive anymore through the mere existence of low labor costs – they need to continuously increase their operational performance level to remain competitive. A supplementary development is the rise of new emerging markets and the progressing of the "low cost country manufacturing caravan". Companies have been following the changing low cost countries in recent years to realize optimal cost efficiencies. By doing so the global networks extended and changed regularly, driving complexity in global networks and yielding a jumble of unaligned sites.

Figure 1. Maturing of Emerging Markets



1) Emerging and Growth-Leading Economies: Expected Incremental GDP in the next 10 years to be larger than the average of the G6 economies (G7 excl. the US)
2) Expected Incremental GDP in the next decade to be lower than the average of the G6 economies (G7 excl. the US) but higher than Italy's (G6 Minimum)
3) IMF = International Monetary Fund

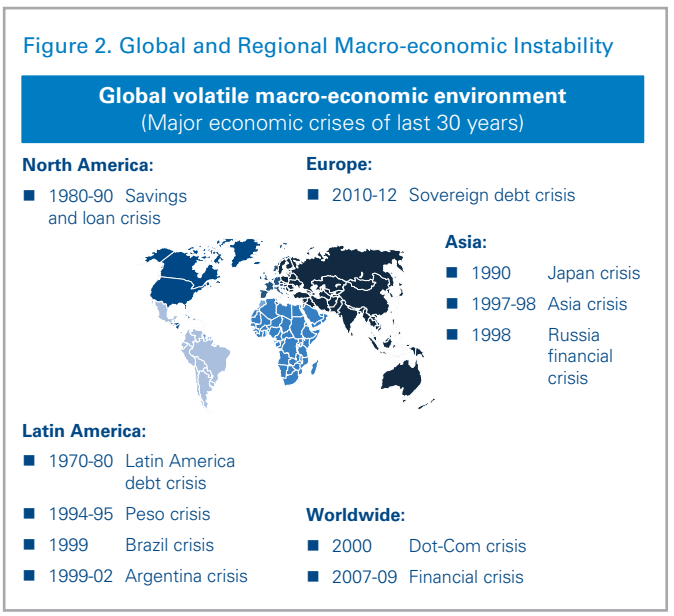
Mega trend II: Global and Regional Macro-economic Instability

In the last decade most companies were severely affected by a major development trend: Macro-economic environments keep on destabilizing unexpectedly in different business areas globally. During the last 30 years the economy was hit by two major, worldwide crises and several regional crunches (see Figure 2). This market volatility forced many companies to act with a pure short and mid-term focus. In addition market conditions keep on changing rapidly as reactions on downturns by adopting consumer behaviors or increasing governmental regulations. As a result many companies could not prepare their operations to react flexibly throughout the full global and local operations network in future situations.

The influence of these mega trends yields a mix of sites in mature and non-mature markets. These sites are often characterized by not being focused according to their core competencies as well as their role in the entire network (especially crossing country and continental borders). This results in a complex footprint puzzle limiting operational flexibility and effectiveness.

Recent studies of the University of St. Gallen in Switzerland have shown that the optimization potential is by far not tapped at the majority of global companies. In mature markets performance levels are reaching their boundaries; the optimization of local performance levels has been on the agenda for several decades now leaving only marginal potentials especially in highly developed countries. Meanwhile the optimization potential regarding the global network is estimated huge with 45%. However the majority of this potential remains untapped: Most companies can only leverage a potential of less than 10%, neglecting a consequent and comprehensive optimization of their overall setup from a local and global perspective.

Figure 2. Global and Regional Macro-economic Instability



Why Most Global Companies Are Not Prepared to Solve the Challenges of the Operations Footprint Puzzle Today

The fact that most companies' operations networks are trapped with their footprint puzzle not being prepared to react flexibly and effectively to market developments can be broken down into three widely spread defects that are true on a global and local scale:

While changing business environments are driving complexity in global networks, this often also means a loss in focus. Assuming site roles had been clearly defined in the beginning, the regular expansion of the global network with new sites added in different locations influences this status negatively increasing the networks' complexity. This is pushed further by the fact that site relocation and new expansion decisions are often influenced by local interests and current situations instead of being based on a strategic, top-down and long term view.

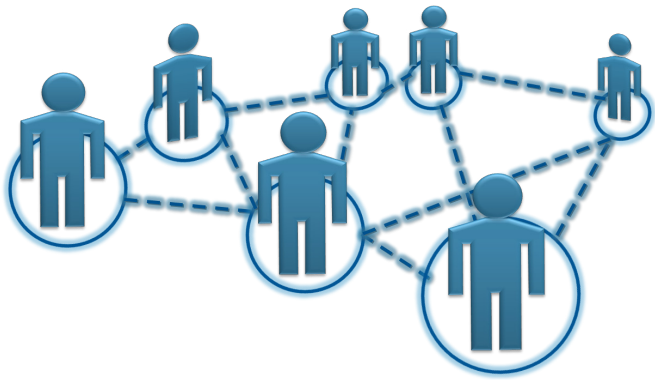
➔ 1st **Defect:** Global operations networks are **complex and not focused**

The increasing complexity and missing focus show further disadvantages: Complexity goes mostly in line with low transparency of the global structure and inconsistent local strategies, competencies and processes due to missing aligned steering systems. The global networks become hardly manageable and promote local actions that are prone to be not ideal for optimization on a global scale. The local entities act discrete and unaligned and tend to build a culture lacking openness towards external exchange and collaboration.

➔ 2nd **Defect:** Global operations networks are **missing transparent and consistent** governance **structures, competencies,** processes and an **open** collaboration **culture**

Another result of a strong local orientation is a high difference in cost and performance levels between sites leaving significant room for improvements regarding the overall setup. Moreover, while markets and their requirements are volatile and changing rapidly, the need for efficient and flexible adaptations increases. Balancing of fluctuating demands and conditions can only be achieved by involving all affected partners internally from R&D to marketing as well as external suppliers, customers and further partners. A missing collaboration throughout the full value chain leads to sluggish reaction times by complicated, hierarchical structures and in the worst case to false local and global decisions due to information asymmetries.

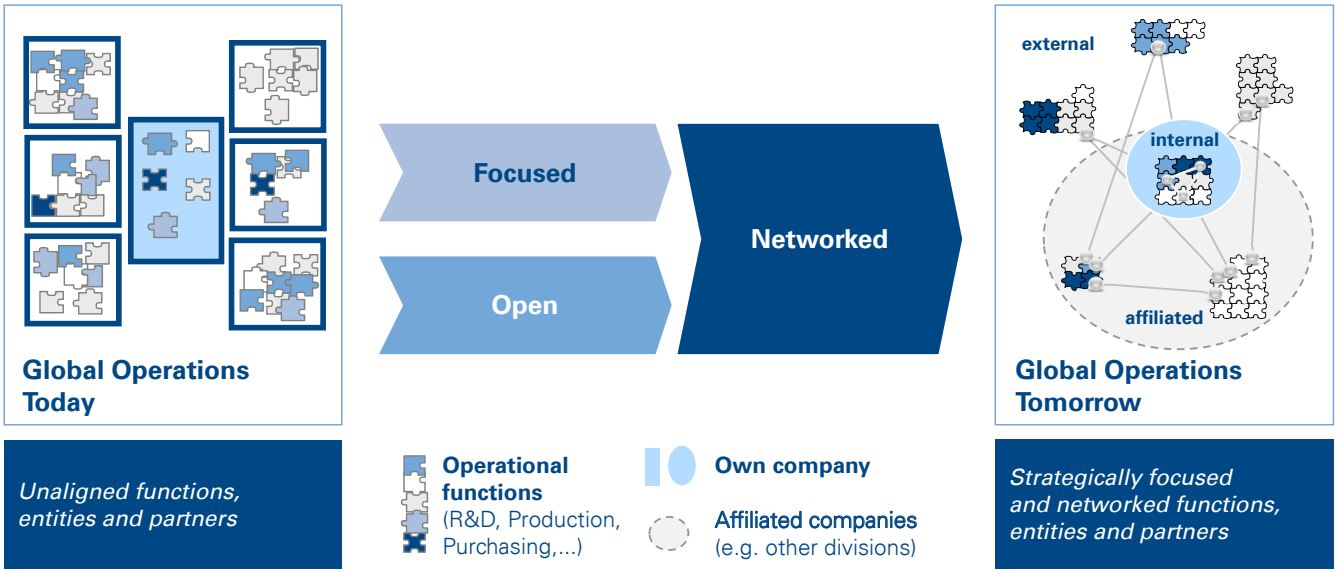
➔ 3rd **Defect:** Global operations networks are **not optimally networked** internally and externally hindering a continuous best practice exchange and flexible adaptations of the global network



But how can companies solve the operations footprint puzzle to transform towards an open, focused and networked global setup while consistently improving local performances in practice?

Guided by a Vision: Focused, Open and Networked

Figure 3. Transformation towards focused, open and networked global operations



In order to overcome the three defects and to allow exploiting the full performance potential of a global setup while being able to react to changing market situations flexibly, an ideal operations network has to be focused, open and networked on a local and global scale (see Figure 3).

Case Study Global Manufacturing Company: Situation and Complication @ ManCo

ManCo is a leading, global manufacturing company present in Europe, South East Asia and the Americas. The product portfolio can be clustered in the manufacturing of know-how extensive high margin products as well as labor extensive low margin products. Company ManCo was in a situation threatening its future global competitiveness: A major competitor in the Americas had been acquired to extend the operations network in order to extensively increase market shares in the North and South American markets quadruplicating revenues within 10 years. After running the American operations across six sites for 2 years, the executive leadership realized that the American network was lacking required performance levels to fulfill the overall goals while the residual global network was hit hardly compensating weak performances and demand fluctuations of the American operations.

Focus operations: Strengthen Core Competencies to Reach the Most Effective, Global Setup

Focused global operations are characterized by a concentration on value enhancement in all strategic and operational areas. They have a clear focus that supports the corporate strategy and alignment of businesses across all regions and functions. To establish this focus, a main corner stone is the concentration on core competencies in a broader, than usually used sense. Besides the pure customer centric concentration on core product competencies, operations benefit most from concentration of value chain competencies and know how pooling (e.g. through Centers of Competence, lead technology factories, Shared Service Centers or knowledge management systems).

In order to focus operations initially, a comprehensive approach combining a short term perspective to improve local capabilities and performances and a long term view to yield an optimal, global operations network is required.

To derive short term optimization measures, the current operations have to be analyzed broadly in an efficient, minimally time consuming way. One powerful tool that can be leveraged to assess local site capabilities and current networking throughout the operations is the **Operations Maturity Assessment**.

An Operations Maturity Assessment sets the beginning of the whole transformation process. The main objective is the creation of transparency on the current performance levels of single sites and on their maturity within the overall operations network concerning collaboration. During an assessment each site's current operational level and degree of collaboration is mapped for all important entities and functions throughout the value chain (see Figure 4). The full value chain should be covered thereby, i.e. including all relevant functions as R&D, Purchasing, Manufacturing/Engineering, supply chain/logistics, sales/marketing as well as corporate functions. For each function the dimensions strategy, management and steering, organization, processes, staff, culture as well as supporting IT technologies are assessed. To stay pragmatic and allow for management decisions, a maturity score is defined showing the current state in four simple levels from "underdeveloped" to "world class" for each category and the overall operations network. As a result, site specific and operations-spanning improvement roadmaps can be developed to align and increase performances towards a mature, top performer or even world class level on a short-term, 1-2 year basis.

The transformational, long-term perspective should center the definition of an optimal, global site structure and strategy. A regular alignment with the short-term improvement initiative should be established to guarantee a smooth transit to the new future global footprint. A practical but innovative solution approach to fulfill this task is the **Value Chain DNA Design**.

In medicine and molecular biology the abbreviation DNA describes a nucleic acid containing the genetic characteristics used in the development and functioning of all known living organisms. The DNA thereby consists of several segments carrying the different genetic characteristics. The Value Chain DNA Design transfers this concept to global footprint design issues in a simplified manner: A Value Chain DNA contains characteristics required to plan, source, make and deliver a specific product and component group. In this manner the Value Chain DNA consists of all relevant requirements

Figure 4. Operations Maturity Assessment

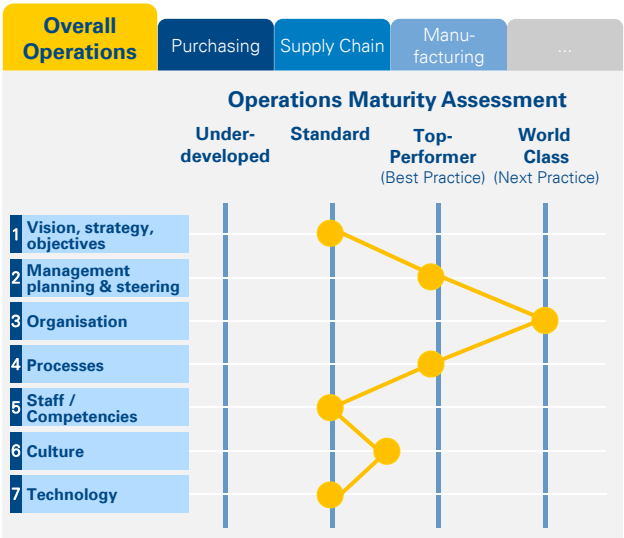


Figure 5. Value Chain DNA Design

and specialties of the value creation throughout the whole value chain including production technologies as well as supplier and customer's quality, cost and delivery (QCD) requirements.

In the best case all Value Chain DNAs located in a specific site are clearly focused and aligned to optimally leverage similar core competencies of a site. In reality this holds true in rare cases only. Thus, the main objective of the Value Chain DNA Design is a re-arrangement of product and component groups to define sites, which can optimally leverage the strengths of their value creation process (see Figure 5). To tap the full potential of the network in the long run after the initial transformation, the Value Chain DNA Design principles should be established as institutionalized, regular standards and be integrated in each SOP (start of production), site allocation and network design decision.

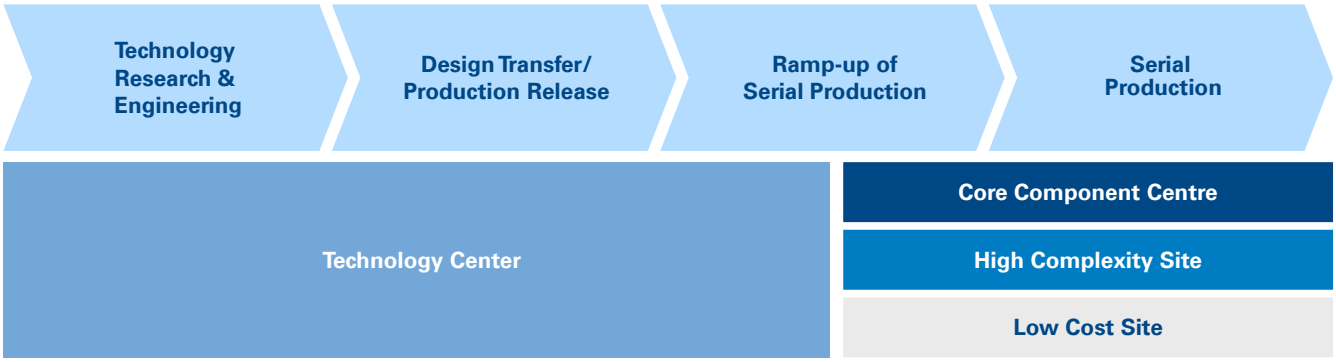
The Value Chain DNA Design methodology was also used to focus ManCo's operations in the long-run. The outcome of the Value Chain DNA Design yielded a focused network to be implemented within a time range of 3-5 years.

Two out of six sites were phased out in the future network. For each of the remaining sites, a specific role within the future network was defined:

- A **high complexity site** is responsible for the manufacturing of products with high value and typically complex production processes and high production technology requirements. This site is allocated near technology agglomeration areas to ensure the availability of skilled staff.
- A **low cost site** is responsible for the manufacturing of products with low production complexity whose margins are highly influenced by low production cost. To not being dependent on production cost only, a continuous improvement process is key to bring up productivity on a mature level in the mid-term. In the specific situation a Mexican site already existed but it was decided to move to another South American location ensuring production stability (yielding a higher total cost of ownership on a long term)

- To leverage production synergies optimally and reduce dependencies on supply related disruptions, a **core component center** is defined. This acts as an internal supplier for critical components. Furthermore the core component center sets the basis from a manufacturing perspective for extended product modularizations in the future.
- Another critical role in securing production stability and allowing for overall flexibility is established in the fourth site: A **technology center** (or ramp up site) is setup as a model factory. All newly introduced product groups (e.g. by new product introductions (NPI) or changing production technologies) are setup up here first. The purpose is to ramp up manufacturing lines and stabilize production without influencing stable operations in other sites by immature production concepts or technologies. After main "teething troubles" (e.g. high rate of non-value added tasks due to immature processes or high machine failure rates due to suboptimal configurations etc.) are cured successfully, the value streams can be transferred to the respective other sites (see Figure 6). An additional advantage to the stability argument is furthermore that new and innovative concepts can be tested flexibly without interfering with daily operations.

Figure 6. Role of a Technology Center or Ramp-up Site



Open Operations: Enable Global Operations for Broad collaboration and Transformational Change

Open operations are characterized by their consistency and transparency as well as openness for collaboration and change. This is enabled by aligned steering systems, processes and competencies. Amongst these, an important attribute is the staff culture across all functions and regions embracing openness. This is important to enable internal and external networking throughout the operations globally.

The opening of operations from a cultural point of view includes several aspects of defining joint visions and targets of all local stakeholders as well as establishing aligned values. In the following we will concentrate on two especially important tasks to obtain theses aspects sustainably: These are **leadership alignment** of the different sites and corporate functions and **staff enabling and mobilizing**.

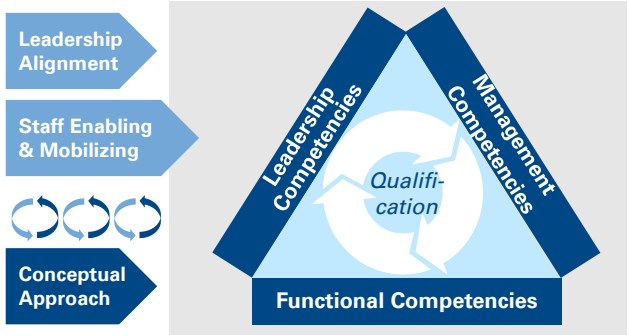
During a transformation journey towards a focused, open and networked organization, these two elements are in fact an important step to go along with the conceptual approach (e.g. process alignment or focusing the operations). In this manner a high quality of the conceptual input required as well as an early buy-in of all stakeholders can be ensured.

The main objective of the **leadership alignment** is the inclusion of all relevant stakeholders on management level into one joint discussion to reach a common vision and mobilize for continously changing the company to the better. The leadership alignment part therefore should start with or even before any conceptual actions. Powerful tools to align the global leadership are **RoundTables**. RoundTables describe a format where all major leaders of the local sites and corporate functions meet regularly (e.g. every 4-6 weeks in the beginning) at one specific location to discuss the major targets and characteristics of a future network structure and to influence conceptual decisions directly following the whole conceptual approach. Besides regular workshops and discussions, advanced change and teaming exercises establish one joint and aligned team effort across all leadership areas. It is important that the RoundTables will be continued after the initial transformation process (in a less intensive cycle) sustaining a strong team spirit and openness on management level and establishing a strong global and cross-functional decision board.

At ManCo the RoundTables could align several site leaders that far, that a joint decision of all site leaders could be reached to reduce site number regardless of the fact that the own position might get damaged or even lost.

Besides purely "capturing" the management level, **staff enabling and mobilizing** is on the other hand highly important to reduce uncertainty across all staff levels and to ensure that the right competencies are available to implement and live focused, open and networked operations sustainably. Certainly the standard change management tools as regular communication and site workshops to mobilize people are an important part of the activities to be conducted. But to truly enable staff, a holistic qualification concept has to be set up ingraining the vision of a networked global setup and reflecting the future network requirements within the competencies of all relevant staff members (see Figure 7).

Figure 7. Staff Enabling and Mobilizing: Qualification Concept



At ManCo, the training setup was built around defined training modules that were clustered into different program levels (Basic = "yellow belt", Advanced "green belt", Expert = "black belt") to address different development targets of employees. Thereby the modules concentrated on three main areas of expertise necessary to build a joint and globally networked organization: Functional expertise, management expertise and leadership expertise.

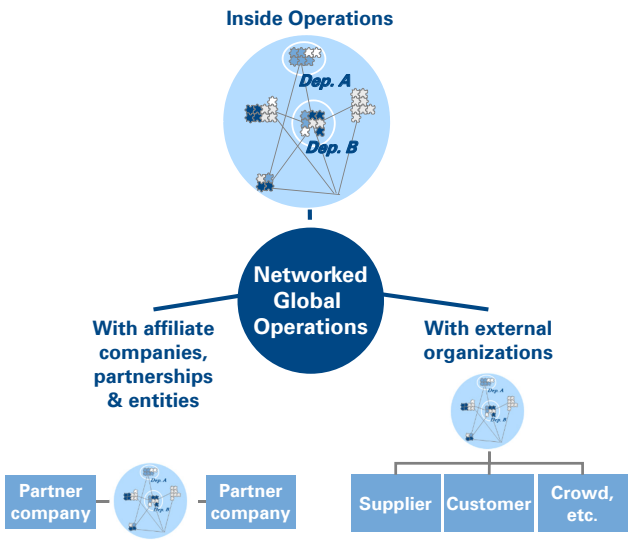
Functional expertise trainings contained the know-how transfer concerning basic and innovative methods to optimally conduct the core functions purchasing, supply chain and manufacturing. These modules spanned from regular presentation based sessions in the yellow belt program targeting a broad audience (e.g. including cross-functional partners) to full on the job coaching of selected high potentials in the black belt program. These functional trainings were supplemented by management competency trainings including e.g. project management and problem solving techniques as well as leadership competency trainings including situational management and cross-cultural communication.

Effectively Network Operations: Leverage Collective Intelligence With Network Partners to Boost Value Contribution

Networked global operations are characterized by each entity's self-conception to link with a multitude and great variety of internal, affiliated and external partners. Collaborative networking in this sense is based on the theory of **collective intelligence** using the capacity of human communities to co-operate intellectually in creation, innovation and invention. This allows the company to tap unexploited sources of decentralized knowledge and harness the intelligence of a large group of people and organizations ranging from company employees to external partners. Furthermore it enables rapid and flexible adoptions to market situations leveraging the full capacity of an efficiently collaborating site network.

Networking can be classified in different areas that are addressed (see Figure 8): Networking within the local and regional operations, networking with affiliated companies, partnerships or entities as well as networking with external organizations. Internal collaboration thereby includes collaboration throughout the entire value chain from R&D to marketing on a regular and institutionalized basis. Collaboration with affiliated partners describes the alignment and information exchange with partner companies as other divisions or group companies. External collaboration on the other hand incorporates the close integration of suppliers and other external partners (e.g. customers and competitors) into internal operations to use a broadened domain of available competencies.

Figure 8. Classification of Networking Partners



At ManCo, Networking within operations was fostered by internal communication channels (supported by cloud based knowledge management applications and corporate social networking tools), a long-term cross-functional organization structure and project teams as well as a regular best practice exchange. Especially the latter can leverage high improvement potentials in a formerly unaligned global operations network. Cross-functional teams drive the collection and evaluation of local best practices complemented by external and academic benchmarking input (e.g. like the Arthur D. Little Operational Excellence studies in cooperation with the University St. Gallen). After prioritizing existing best practices a rollout plan on all sites is defined to bring the operations on a consistently high level on a regular basis apart from the initial transformation process.

Networking with affiliated entities, especially between the continental organizations in Europe, North America and Asia, was setup besides the use of a global, cross-functional structure by implementing a global **backup concept**. The backup concept targeted at balancing demand fluctuations and market volatility globally. For critical, high margin products production lines were mirrored in at least two of the three continental organizations. In case of strong demand fluctuations in one market or delivery issues, the other market was setup to increase production volumes and to deliver products to customers globally keeping the service levels and meeting customer's requirements.

Networking with external organizations focused on key suppliers in the first attempt. Suppliers were critical for a smooth operation, but the key supplier management and supplier integration had been underdeveloped. Implementing a global key supplier management system was an important step to realize global potentials in purchasing and the supply chain. The latter especially was addressed by allowing for innovative supply chain concepts integrating key supplier to a high extent e.g. by automated Kanban systems or using Vendor Managed Inventor (VMI) concepts. A close collaboration with key suppliers sets the basis for win-win partnerships by ensuring high service levels and low costs, while rewarding the suppliers with performance-related long term contracts securing their revenues.

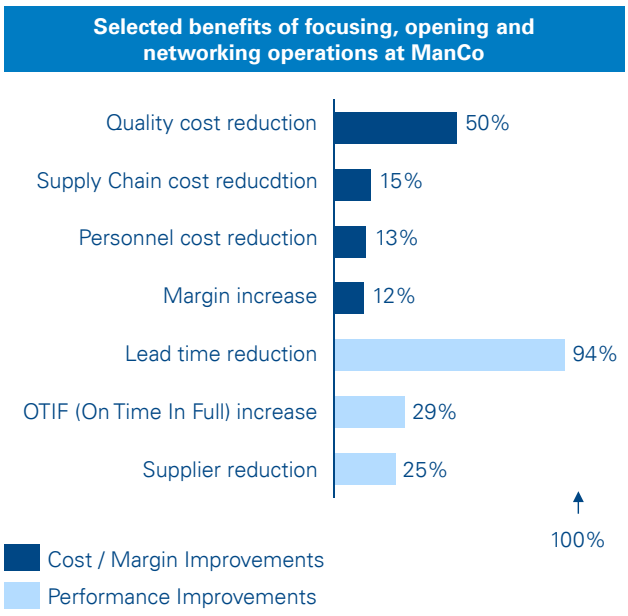
Which Quantitative Benefits can Companies Expect by Transforming to a Focused, Open and Networked Operation?

Transformation towards focused, open and networked operations can lead to very positive and tangible cost and performance outcomes (see Figure 9):

At ManCo, cost wise the highest improvements could be identified regarding quality costs. Quality costs included costs due to warranty and scrap. These were positively influenced by the stabilized production in dedicated high complexity and low cost lead plants, not allowing instable production lines to interfere. The new focused global structure within ManCo's operations combined with local operational improvement initiatives lead to supply chain cost reductions of 15% and personnel cost reduction of 13%. In total the operational margin increased by 12%.

In addition to the pure cost and margin focused improvements several performance optimizations could be accomplished. The optimized structure and stabilized manufacturing setup as well as a closer integration of suppliers resulted in a lead time reduction of 94%. The efficiency and reliability improvements also yielded a by 29% increased OTIF (On Time In Full) rate compared to the former state. Furthermore, the supplier base could be reduced by 25% reducing complexity throughout the value chain.

Figure 9. Benefits of focusing, opening and networking operations at ManCo



Summary

Increasing worldwide and local requirements have in many cases formed a complex, unmanageable global operations footprint puzzle of not focused and unaligned sites with ambiguous roles and competencies limiting operational flexibility.

Three main directions of impact have been defined to tackle this issue: Companies should establish a **focused, open** as well as effectively **networked** setup enabling continuous transformations of the global operations footprint while improving local performance levels continuously.

To **focus** operations the short-term and the long term perspective have to be considered. Efficient tools to do so are the **Operations Maturity Assessment** and the **Value Chain DNA Design**.

The former (Operations Maturity Assessment) enables a company to get a comprehensive picture of its operational maturity across all sites, relevant value chain functions and operational dimensions (from strategy to technologies used). The objective of this exercise is to derive local and site-spanning improvement potentials on a short-term basis to shift local operations towards a consistent, mature level.

The Value Chain DNA Design is a methodology to optimize the overall site structure of a global network. On the lines of the medical or molecular biological definition of the DNA, product and component groups are described by their specific characteristics in the value chain. These so-called Value Chain DNAs can be effectively used to rearrange the allocation of product and component groups to production and distribution sites; thereby the sites' configuration can be improved to optimally leverage competencies and capabilities. In an optimal organizational setup, the Value Chain DNA logic is deeply rooted in all major processes concerning sop (start of production), site allocation and network design decisions.

Simultaneously to the focusing efforts the operations should be **opened** with transparent and aligned structures and steering systems as well as an open culture fostering collaboration widely. Especially the latter is a major factor of success. Cultural change should be tackled on two levels by a **leadership alignment** across all sites and corporate functions as well as **staff enabling and mobilizing** globally.

Leadership alignment can be established efficiently forming a high-performing team of all leadership staff using a Round Table approach. During joint, physical meetings the leadership team can define joint visions and values as well as solve global conceptual issues. The Round Table concept, if institutionalized, furthermore acts as an intrinsic role model for global collaboration across all sites and functions.

To permit transformational change and foster collaboration an alignment of the leadership team is not enough. The staff members of all locations have to be enabled by comprehensive training programs to implement a collaborative environment and mobilize using well-known change management and communication instruments. The training programs have to complement functional expertise by management and leadership competencies on all levels to implement abilities to collaborate efficiently in global, cross-functional teams widely.

Opening and focusing operations set the basis for **networking** on a global scale. Networking is defined as comprehensive collaboration with **internal, affiliated and external partners**. The resulting **collective intelligence** offers a broad set of know-how and capacity to be leveraged.

Operations can highly benefit from internal collaboration through best practice exchange and the utilization of the full set of cross-functional knowledge. Collaboration with affiliated partners as other internal divisions or other continental entities enables an optimized capacity balancing e.g. by establishing a worldwide production backup concept. And finally external collaboration with suppliers and other external partners broadens the optimization potential of the full value creation process exceeding own capabilities by far.

Implementing these key principles, companies can make a major step forward to tap the full potential of their global network and become significantly more flexible in reacting on changing market situations rapidly.

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