Supply Chain Management in the European Chemical Industry

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I. Introduction

This study outlines the current status as well as major trends and future requirements for supply chain management (SCM) competitiveness in the European chemical industry.

Comprehensive insights are based on in person interviews conducted with senior corporate or divisional SCM executives and authorized staff members of six major chemical players. Interviewees have either positions of European or global responsibility.

The following companies participated in the study:

BASF
Bayer
Ciba Specialty Chemicals
Clariant
Dow
DSM

A detailed analysis of relevant publicly available information from sources such as scientific literature, web pages, press articles, broker and company reports has been accomplished and results included to validate and complement the findings from the interviews. Industry trends are also elaborated based on Bain & Company's global industry experience.

The scope of the study encompasses the customer facing part of the supply chain. The focus on customer facing elements reflects the organizational setup of chemical companies in SCM today. Procurement and manufacturing aspects as well as issues of handling returned goods/recycling materials are not discussed.

In reference to the SCM framework of the Supply Chain Council (chart 1) the most important aspects covered in this study are highlighted.

II. Executive summary

SCM is currently a key functional priority for European chemical companies.

In section III of the study we will outline the development of supply chain management in the chemical industry and characterize different organizational models in place today. SCM is part of top management's agenda due to prior corporate restructuring activities, increased pressure for competitive differentiation and available management capacity after completion of software implementation and E-commerce projects. Also, rising cost pressure has increased the need to realize staff efficiency across the entire SCM process and organization.
Most firms interviewed have completed or are in the process of implementing new organizational SCM structures. There are substantial differences in the organizational supply chain set-up. This study discusses four different organizational models that range from global SCM centralization to divisionally managed decentralization.

Section IV provides an overview of major SCM initiatives currently being undertaken by chemical companies. SCM initiatives include tight cost management, improvement of order fulfillment processes and introduction of key performance indicator (KPI) systems.
Total SCM costs show a wide range (8-10% to 12-14%) of total costs of participating companies. Adopting a tighter cost focus can subsequently lead to an SCM cost reduction of almost 40%. SCM cost management focuses on freight/transportation, inventory, warehousing and customer service organization consolidation. Inventory reductions are to be mainly achieved over time by dramatically improving the planning, forecasting and replenishment processes. However, combined inventory and warehousing structure workout programs can lead to significant one-time reductions in inventory of up to 25-30%.
Order fulfillment is subject to optimization projects that yield increased customer service levels. KPI systems are to be introduced constantly and consistently to monitor and actively manage SCM performance.

In section V key elements of SCM excellence are summarized. High performance SCM models are based on four key components. First, an appropriate organizational structure is required to fulfill complex SCM functions effectively and efficiently. Secondly, standardized and consistently implemented processes build the interfaces within the organizational structure. Thirdly, systems and tools act as enablers to facilitate process execution (e.g. software planning tools) and to design the supply chain (e.g. segmentation). Finally, people are a key factor, since capabilities and motivation determine ultimate SC performance.

III. SCM organizational structures and evolution

Supply chain management in the European Chemical industry is in a major transition phase. The major task of supply chain management is to balance supply chain costs against customer service levels in order to help business units deliver against sales and volume targets. While the focus in growing markets/segments is often on maximum service levels, the more mature status of the chemical industry in Europe as well as the expected economic climate over the next two to three years may lead to an increasing cost focus of supply chain managers. Subsequently, redundant resources on all levels are identified and tightly managed.

According to all interviewed supply chain executives, SCM is, from a corporate perspective, a high priority. The majority of the participating companies have either recently undergone a fundamental SCM reorganization or are in the midst of a transition process (please refer to chart 2). Reorganization efforts cover both organizational structure as well as business process reengineering. In particular, process implementation is supported by significant software projects. However, not all software implementation follows a solid process reengineering exercise.

Three effects drive SCM reorganization:

- **SCM reorganization follows corporate restructuring**
  Since the mid-90ies most firms have gone through fundamental corporate restructuring. The key objective has been to establish customer- and market-oriented businesses. Activities were regrouped into new divisions and/or business units. Consequently, supply chain organizations had to be aligned to best support these new structures.
- **Competitive differentiation through SCM**
  Customer surveys reveal that SCM reliability has evolved as one of the key purchasing criteria. SCM performance is the decisive criterion, when customers are indifferent to price and product quality offered by various suppliers. Hence, a supply chain structure delivering outstanding SCM performance is a prerequisite to create positive customer perception, lock-in business and retain customer loyalty and, thusly, sales over time.
- **Available management capacity for operational excellence in SCM**
  Most companies have completed corporate projects for e-commerce as well as software implementation. Freed-up management capacity thus becomes free to focus on SCM operational excellence .

Study participants follow four different models to optimize supply chain **structures**. The spread ranges from centrally managed decentralization to complete supply chain centralization.

- **Centrally managed decentralization** (please refer to chart 3)

Some SC organizations passed through three different organizational stages. Phase 1 was characterized by complete SCM centralization due to the high amount of commodity products and a concentration of sales and volumes in the region of headquarters and/or central extant production sites. In this first phase, the set-up of most chemical

companies was still functional. In phase 2, SCM shifted to decentralization as a result of M&A activities and globalization of the business. Profit center implementation led to increased independent business units. In the current phase 3 the integrative approach consists of three organizational elements:

Global SC function at corporate level

The purpose of a corporate SC entity is to assure consistent SCM quality and performance standards throughout the organization. Key tasks included standard-setting initiatives, knowledge transfer facilitation as well as rigid cost controlling and non-financial performance monitoring. Standard-setting initiatives include key performance indicators or tools and process developments.

SC service organizations for product-oriented divisions or business groups/units

Functional services are offered to business units when either scale or specific know-how is required, but which single business units cannot provide at competitive cost. Services can be both of physical (e.g. filling) or administrative nature (e.g. documentation preparation). Prerequisite to the service provision is the organization's ability to offer market competitive service level agreements (SLA). Business units are otherwise free to outsource services by lower market rates.

Operating SC units at business unit/group level

The operational supply chain manager in a business group/unit is ultimately responsible for supply chain performance within a business. Scope of tasks and allocated manpower depend on size and nature of product portfolio, customer base and number of orders handled. In any case compliance with standards and procedures developed by global SCM is mandatory. Furthermore "make, buy internally or outsource" decisions have to be taken by operational SCM.

- **Centrally supported decentralization** (please refer to chart 4)

In the second identified organizational SC model the corporate SC unit is less powerful and is focused on "supportive" functions. The coordinating and advisory role at corporate level has neither disciplinary nor technical authority vis-à-vis operational supply chain management.

Operational SC units function in an almost self-sufficient manner. Final decision authority to adopt a new SC procedure recommended by corporate SCM always remains with operational SC units at the business unit level. This is also apparent, as BU-independent SC service organizations hardly exist.

- **Divisionally managed decentralization** (please refer to chart 5)

In a third organizational alternative, no SCM function is located at corporate level. Central SCM units exist on the divisional level. SCM importance is strengthened, in comparison to complete decentralization, by making supply chain managers part of the division management team along with business unit heads. Each division can decide on the central SCM configuration independently, but essentially covers standard setting functions, project management and controlling. Corporate-wide knowledge transfer is maintained through regular cross-divisional supply chain manager meetings.

An operational supply chain management in the different business units is in charge of most executing activities. Usually, there are no central service organizations to support the divisional SCM.

- **Centralization** (please refer to chart 6)

In the centralized approach, all SCM activities have been pooled into one large SCM organization. Major functions include controlling, IT management, operations and customer service. Operations represent most of the manpower for inventory, warehouse and transport management. Manpower in customer service is large due to the high labor intensity of this activity. Pooling of order-related sales back office tasks allows realization of efficiency gains over time.

Centralization is used to promote a supply chain system conversion into a pull system based on KANBAN logic. Warehouses are automatically replenished when inventories drop below pre-defined minimum stock levels. KANBAN replenishment is performed throughout the entire value chain. Once the production site inventory falls below threshold production, planners are informed to coordinate manufacturing orders and initiate production cycles. Major challenges in implementing the pull system are the determination of minimum stock levels and exhaustive IT automation. As divisions share both manufacturing sites and warehouses, only a central SCM and not a divisional solution can be considered.

Aside from structural reorganizations, most firms have implemented or launched business **process reengineering initiatives** to standardize core processes. Two main processes are fundamental for effective and efficient customer facing SCM

- Planning and forecasting
- Order fulfillment

Accurate planning and forecasting is by far the most difficult issue for SCM in the chemical industry. Forecasting accuracy is a major SCM cost driver, because inventory levels strongly depend on it. Companies' internal as well as customers' forecasting capabilities are characterized as weak. Consequently, most firms have started initiatives to improve planning reliability (see section on major SCM initiatives).

In contrast, participants agree that the order fulfillment process can be standardized and "automated". The level of operational standardization differs widely, since some companies started process reengineering projects earlier than others. Various projects are underway to optimize IT supported order processing. Insufficient correct and real time available product and customer data are the underlying root causes for excess cost in order entry processes. For this reason, delivery commitments to customers either cannot be made in initial contact or are unreliable. As a result trouble shooting increases and customer complaints occur (see section on major SCM initiatives).

IV. Major SCM initiatives

Current SCM initiatives pursue the following objectives:
First, supply chain initiatives focus on untapped cost reduction opportunities. Secondly, measures have been taken to improve the order fulfillment process, especially the order entry sequence for increased customer service and satisfaction. Thirdly, all firms implement or optimize key performance indicator systems (KPIs) to control and actively manage SCM performance (please refer to chart 7).

A. Aggressive cost management resulting in direct bottom line results

On average, participating companies estimate total supply chain costs at around 10-12% of total cost, whereas followers assume at least 12-14% or more (please refer to chart 8). Best demonstrated practices on single business unit level potentially achieve costs below 10%.

Most important non-headcount SC cost components are freight and transport management, inventory carrying and warehousing cost. To address these cost components various measures have been initiated:

- **Freight/transport management costs**

Chemical companies have started transport partner consolidation to achieve better terms and to reduce administrative complexity.
Sometimes a central freight procurement unit at corporate level is established to coordinate logistics partners, to bundle purchasing power and to negotiate freight contracts centrally. The highest degree of consolidation resulted in the complete outsourcing of transport management to one leading global logistics provider. The instructed logistics service provider practices IT-based backward integration and manages freight related services comprehensively. Core business of the service provider remains captive transport and global management of local subcontracted carriers. Services include order grouping and ranking, load optimization, delivery planning and control, order tracking and tracing, global document management and financial controlling. The outsourcing decision was taken based on a global tender process, full implementation will require an 18 months plus effort.

- **Inventory carrying costs**

Excess inventory is one of the main cost drivers in the supply chain. While the operational supply usually keeps a focus on finished and intermediate products in ex-factory and regional warehouses, additional hidden buffer stocks tend to exist within production facilities.
On the finished product/customer facing supply chain level, a relatively simple and realistic quick hit is to carry out product related ABC analysis to identify “slow turning” products. Subsequently workout programs for C products have to be set-up to eliminate dead stocks.

The fundamental root cause behind excess inventory of finished product is a combination of inaccurate forecasting and a lack of communication between sales and

manufacturing through SCM. Companies therefore focus on three activities to optimize the planning and forecasting process: process standardization and discipline in operating standard processes, application of standard software planning tools and collaborative planning with selected clients/key accounts.

Firstly, process standardization and discipline is a generic approach that addresses "people issues" as one of the major root causes of inaccurate forecasting. The combination of multiple parties with differing beliefs that provide planning data, inevitably leads to sub-optimal consensus arrangements and yield loss in terms of process efficiencies.
For this reason process sequence and planning content have to be determined top down by senior SCM management. Accordingly, clear roles and responsibilities need to be defined with clear leadership assigned to the process owner. Finally, in case of significant conflict, a binding consensus mechanism has to be established.

Secondly, companies indicate their intent to reinforce application of existing software planning tools as part of process standardization. Widely applied "manual Excel solutions" have not increased planning accuracy. Intensive training for specialized demand planners will offset former lack of software tool familiarity.

The third activity is to strengthen the integration of customer information in the forecasting process., This is partially an already existing practice through the use of informal data sharing with customers. As part of process standardization demand planners will at least contact large customers consistently to obtain more reliable forecast information (please refer to chart 9). Based on both standard planning tools and client collaboration planning process, owners receive the best available data pool for forecasting decisions.

Firms have started to establish supplier relationships through vendor managed inventory (VMI) applications beyond collaborative forecasting (please refer to chart 10). The participants' perception of VMI is ambiguous. Some companies actively push VMI penetration with focus on key account clients through dedicated technical sales support. Other companies have chosen a more reactive approach, questioning whether the effort and one-time investments for VMI applications will amortize.

- **Warehousing costs**

Parallel to inventory cost reductions firms undertake efforts to optimize warehouse structures. Efforts range from complete warehouse or terminal resolution to consolidation through to downsizing remaining warehouses or outsourcing of formerly self-managed warehousing activities. There is Usually an inverse correlation between warehouse structure costs and freight spending. However, since warehouse network rationalization supports inventory reduction, the short-term increase in freight costs is far lower than the combined savings of the other two categories.

Beyond non-headcount supply chain cost optimization, consolidation of customer service units is the major driver in reducing supply chain headcount - and thus costs - even further.

In order to reduce headcount two levers are applied. Firstly, order fulfillment process standardization and optimization leads to clear roles and eliminates double work in the process. Secondly, companies have started consolidating order desks or customer service units. Although order desks are usually not explicitly part of the formal supply chain organization, order entry and order information processing are supply chain activities.
Advanced players have given up maintaining order desks on the country level. Customer service infrastructures are now set-up in 5-7 major European markets and locations covering key languages. This maximum consolidation has led to concentration of 80% of customer service staff at headquarters. Service representatives with language skills are hired and local country service hotlines are used to maintain client perception of “local service”. Only large-scale business units are allowed to maintain customer service staff in different countries (please refer to chart 11).
Accordingly, operational business units concentrate sales back office employees or customer service representatives (CSR) in service centers. CSRs usually continue to be allocated to countries, product groups or clients. This means that customer service centers function differently from pure call centers in which there is no longer a link between CSR and the individual customer. Especially small clients oppose call center service while international key accounts signal preference for call center or single reference point support. Recent developments in the US indicate that call centers for administrative sales support staff offer significant cost reduction potential (please refer to chart 12).

B. Improved order fulfillment process leading to increased customer service and satisfaction

The order entry sequence as a key step in the order fulfillment process is subject to changes covering organizational and IT aspects increasing customer service and satisfaction.

Companies face a number of challenges in order entry. As consolidated client history data is not available redundant information needs to be collected from clients. Customer service representatives have difficulty in determining delivery dates or lead times when talking to customers. A lack of process discipline and a lack of integrated IT systems are root causes for these problems. Furthermore, even if IT infrastructure is in place, users do not use IT tools to their full potential. Subsequently order throughput time is high and productivity of customer relationship employees low. Customers are dissatisfied, owing to the non-availability of delivery dates or owing to later delivery date revision.

Objectives for process improvement projects include conscientiously updated customer data and real-time retrievable stock levels or lead times for out-of-stock products. Based on this information customer service representatives should have the authority to make

binding commitments with regard to delivery volumes and client dates without internal verifications.

In order to make this a reality standardized roles and responsibilities need to be defined for all parties “feeding” data into IT systems. This includes sales, marketing, manufacturing and SCM. SCM as the ultimately responsible unit for order fulfillment should take on a leading coordination role.

C. Continuous and consistent controlling through KPI systems

The third large common initiative is the requirement for SCM specific controlling systems. Supply chain executives need complete data transparency. All study participants have established or are developing KPI systems to track SC performance. The degree of sophistication varies significantly. KPI systems cover both financial as well as non-financial SC criteria (please refer to chart 13).

Most companies are transitioning from “measuring something” to actively controlling and managing functional performance. For this reason KPI systems are consistently implemented across organizational units. The objective is to identify best practices and to derive realistic, yet ambitious targets.

Currently KPI systems are “fashionable” owing to a significant backlog. The reason is as simple as it is shocking: owing to the past functional silo set-up of organizations, companies do not know their exact supply chain process costs.

V. Key elements of SCM excellence in the chemical industry

In order to realize maximum results from a redesign of the supply chain, chemical companies should start by setting a strategic agenda for their supply chain performance. The question whether only to focus on costs or to strike a delicate balance between costs, service levels and sales growth can vary by geography and/or product category. Ideally, strategy drives processes rather than organizational structure to optimize efficiency. Structures should be derived based upon standard processes once the necessary roles and responsibilities can be bundled to assure a minimum number of interfaces and organizational units. However, we do recognize that there are in practice multiple interdependencies between strategy, process, and structure.

Key elements of SCM are related and the implementation of operational excellence of one element often depends on the others. Overall, the organizational capability to execute well defined targets and standards is of key importance. Elements needed for establishing an excellent supply chain organization can be classified into the following categories:

- Structure
- Processes
- Systems & tools
- People

Structure

In order to establish a lean SCM structure, management should consider a fundamental split of three different sets of activities: (1) setting the standards and establishing the tools for an effective supply chain execution, (2) making key decisions in the individual supply chain execution process, and (3) physical handling of products in the actual delivery process.

From our point of view, a corporate SCM unit is best prepared to manage SCM complexity through standard setting and knowledge sharing initiatives as well as through controlling results. For example, a corporate SCM unit defines the forecasting process blueprint, supports the rollout process within the company and monitors forecasting accuracy on an ongoing basis. Benefits of the corporate standard setting include central reporting and data consistency, which allows management to act quickly and focused every time a deviation occurs within the business. A corporate unit also increases SCM visibility and acceptance of standards within the company.

There are only few critical process steps along the supply chain execution path. Decisive are the matching of material from production pipeline or stock to an order and a potential reprioritization of orders in case of product shortage. Organizational units making these decisions should have intimate customer-product-relationship knowledge. Whether critical decisions- making is allocated to a business unit, a business group or, potentially, a regional entity must reflect the overall business model of a chemical company and goes beyond a pure supply chain rationale.

Finally, most product handling activities represent outsourcing potential to either internal or external service providers. Since there seems to be only a limited number of outsourcing partners capable of handling the complex product portfolio of a chemicals producer - with requirements ranging from 40t bulk shipments to small quantities of

highly toxic products - internal service providers are still the norm in the industry. However, we believe that there is an inherent trend in the use of external general contractors, especially for physical transportation and logistics including related paperwork. This achieves a supply chain cost reduction that can lead to a competitive advantage.

Processes

Two core processes are most relevant for an effective and efficient customer facing supply chain organization: planning/forecasting and order fulfillment. Each process has to comply with four key requirements. First, the explicit process owner and assigned end-to-end responsibilities render and hold all involved parties accountable. Secondly, clear and accepted standard operating procedures prevent misunderstanding in process execution. For example, if a global business unit supply chain manager is assigned to lead the global planning process, manufacturing shall not be authorized to overrule forecasts without SCM approval. The third requirement is discipline in the consistent execution of processes. Discipline provides for organizational stability whereas deviation necessarily creates yield loss and excess costs. Finally, all standard process definitions should be regarded as evolutionary steps in a continuous improvement pattern. For the planning and forecasting process this will result in a first wave introduction of IT-supported collaborative planning forecasting and replenishment (CPFR) with a focus on key account relationships. Eventually, when systems provide reliable delivery dates and lead times, the order fulfillment process will follow the planning process and shift increasingly to online ordering for all direct customers and intermediaries.

Systems and tools

Compared with such industries as consumer products, automotive or media, chemical companies are not at the forefront of supply chain systems and tools. While most chemical companies have adopted an enterprise resource planning software (ERP) as a platform for financial reporting, supply chain management functionalities of existing ERP platforms as well as specialized software tools have only been gradually implemented. Chemical companies are “followers” in adopting tools such as vendor-managed inventory (VMI) or in implementing statistical planning to reduce manual efforts and thus costs. In sharp contrast to a relative lack in operational tools and systems, all players have installed or are installing KPI systems to measure and drive supply chain performance, as they are aware of the overall improvement potential.

Given the low level of tools sophistication of in the industry, the following should be applied more systematically in order to improve process stability and cost positions:

- Segmentation: From a SCM perspective, segmentation yields two important results. Identifying supply chain key accounts is a basis for bundling physical transports. ABC analysis helps to distinguish between different levels of customer-desired delivery accuracy and product availability - thus controlling costs at the same time. As well, ABC analysis is at the core of defining an intermediary strategy for C-customer segments.
- Key performance indicators (KPI): While some of the supply chain-specific KPI are straightforward (e.g. product availability, lead time, hit rate, absolute inventory level, forward days cover) others are more difficult to measure and manage. Most participants in this study complained about a lack of SC cost transparency. This leads us to believe that identifying all relevant cost items (freight, warehousing,

inventory, packaging, order entry staff, SC systems etc.) and managing them in an integrated fashion will be a differentiating factor in building relative cost advantages. KPI provide a solid basis for the necessary target setting and controlling process.

- Integrated supply chain software: Fully integrated software is a key enabler for providing all relevant pieces of information at the time of order entry. Overall product availability and target delivery date are missing links in current systems. Furthermore, supply chain managers are only likely to achieve aggressive inventory reduction targets while maintaining service quality levels, if up-to-date actual data is available. Finally, web-based applications can help to minimize interfaces both internally (supply-side) as well as externally (customer-side), which subsequently leads to reduced costs.

People

While supply chain practice in the past glorified those managers who continuously succeeded in getting last minute orders out, a more stable flow of products and information should actually be on top of the list. Therefore, in order to make a supply chain both effective and efficient, supply chain managers need to shift from “trouble shooters” to steady and well-organized planners and “do-ers” among their staff.

The elements for driving overall supply chain staff performance are according to our perspective:

- Dedication to a supply chain management unit with its individual set of roles and responsibilities helps people to identify with their tasks thus increasing motivation. Also, a clear set of responsibilities and related decision-making power drives accountability.
- Constant on-the-job and formal training is necessary to improve skills and capabilities over time. Training should not only focus on formal skills such as planning algorithms and controlling techniques, but should foremost provide a practical day-to-day working knowledge of existing software systems and their potential applications in, e.g., internal KPI benchmarking.
- A direct link between individual supply chain targets, performance and appraisal should be established. This does not necessarily include monetary rewards. It can begin by including the quality of executing supply chain tasks in a list of criteria for a qualitative employee evaluation. Ultimately, performance against targets should drive promotion and pay to a degree inline with company policies. We also see a fourth element to improve performance of supply chain staff.
- Companies should consider hiring supply chain managers from outside the industry, regardless of the perceived high degree of chemical expertise necessary to operate effectively in the supply chain of a chemicals company. Industries such as consumer goods, retailing or media, are more advanced in supply chain practices and tools. In order to jump ahead of competition and build a substantial cost advantage, chemical industry players should look beyond their immediate competitors.

Ongoing improvement of supply chain performance for customers and the lowering of costs simultaneously is a challenging task. We believe that the elements outlined above have great potential. Cost reduction in the order of 40% of current costs should be a worthwhile target to pursue.

VI. Company profile and Bain contacts

Bain & Company, Inc. is one of the world's leading global management consulting firms. Its 2,800 professionals serve major multinationals and other organizations through an integrated network of 27 offices in 19 countries, with headquarters in Boston, Massachusetts. Its fact-based, "outside-in" approach is unique and its immense experience base, which has been developing for more than 29 years, covers a complete range of critical business issues in every economic sector. Bain's approach is based on two guiding principles: 1) working in true collaboration with clients to craft and implement customized strategies that yield significant, measurable and sustainable results, and 2) developing processes that strengthen a client's organization and create a lasting competitive advantage. The firm gauges its own success solely by its clients' achievements.

Bain has conducted over 300 chemical projects/assignments throughout the world in all segments of the industry – from base chemicals to fine chemicals, to petrochemicals (including plastics, resins & polymers), to adhesives and agricultural chemicals among others. Our projects include corporate portfolio strategies, growth strategies, merger and acquisitions, functional strategies, operations improvement programs and organizational development.

Bain also has significant experience in supply chain management. In more than 700 assignments Bain has worked globally along the entire supply chain from purchasing and manufacturing to distribution and logistics. Recent projects at the customer-facing end included transportation, warehouse and inventory management as well as order process optimization and complexity reduction.

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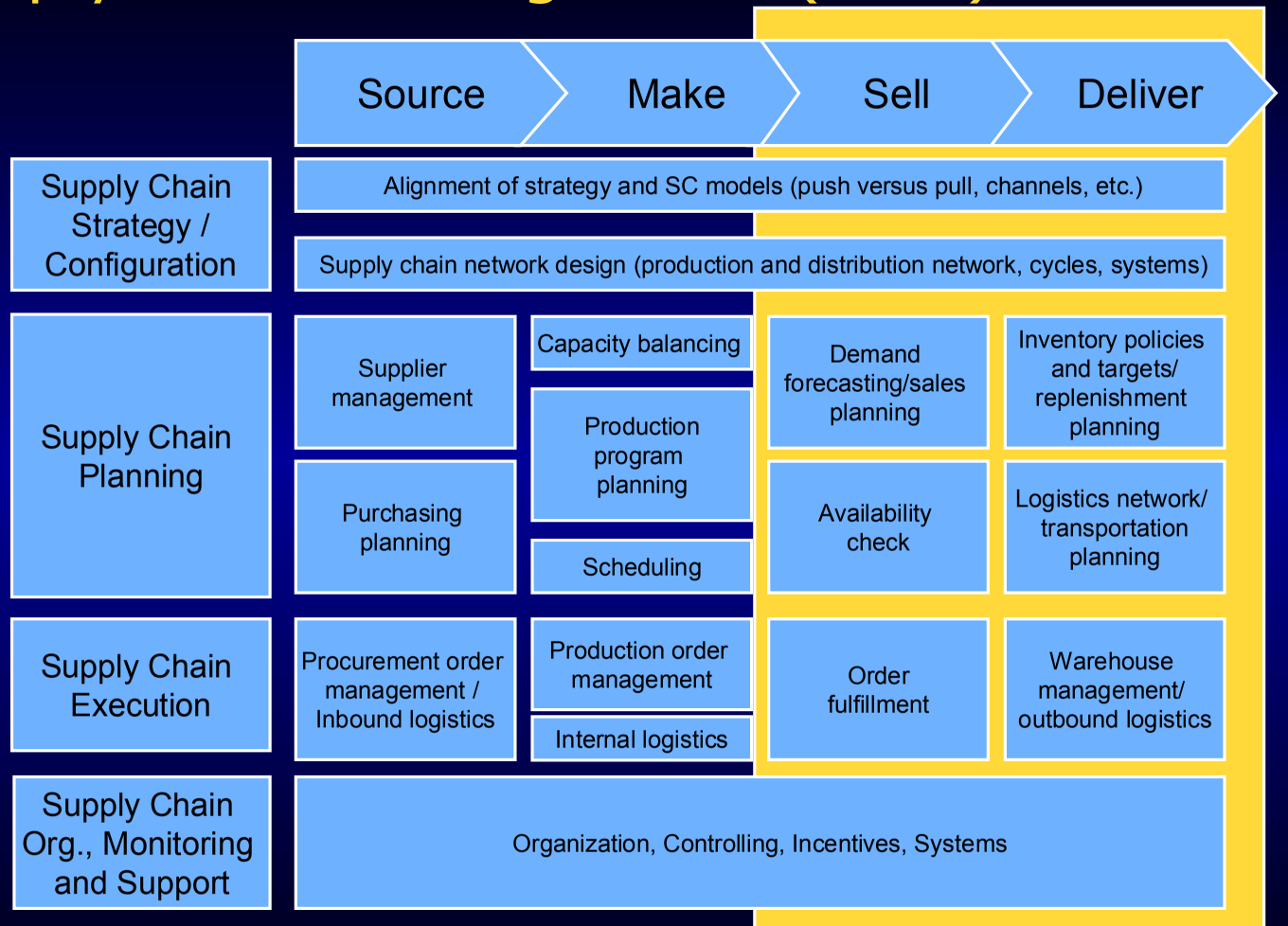
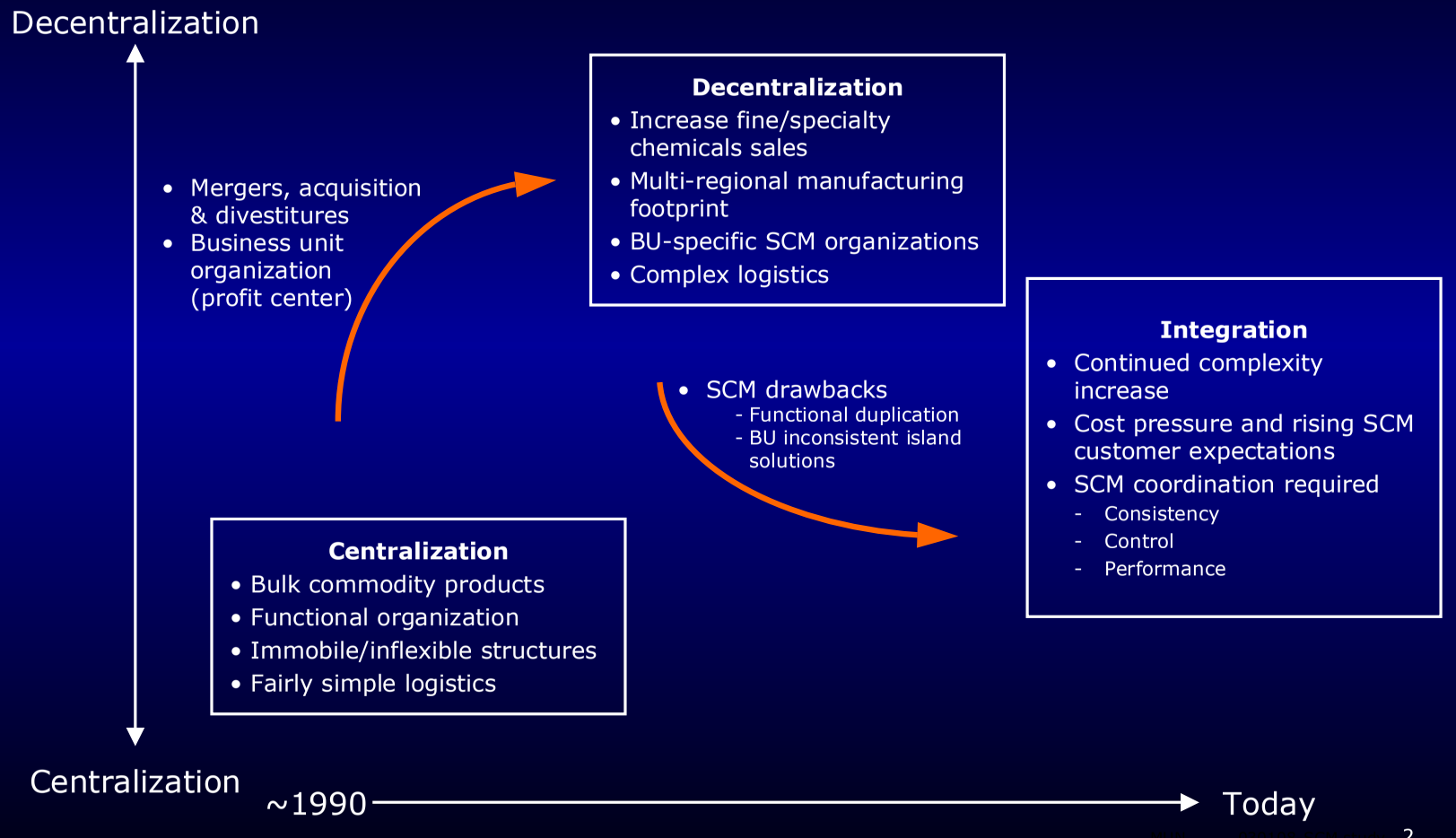
Supply chain management (SCM) framework



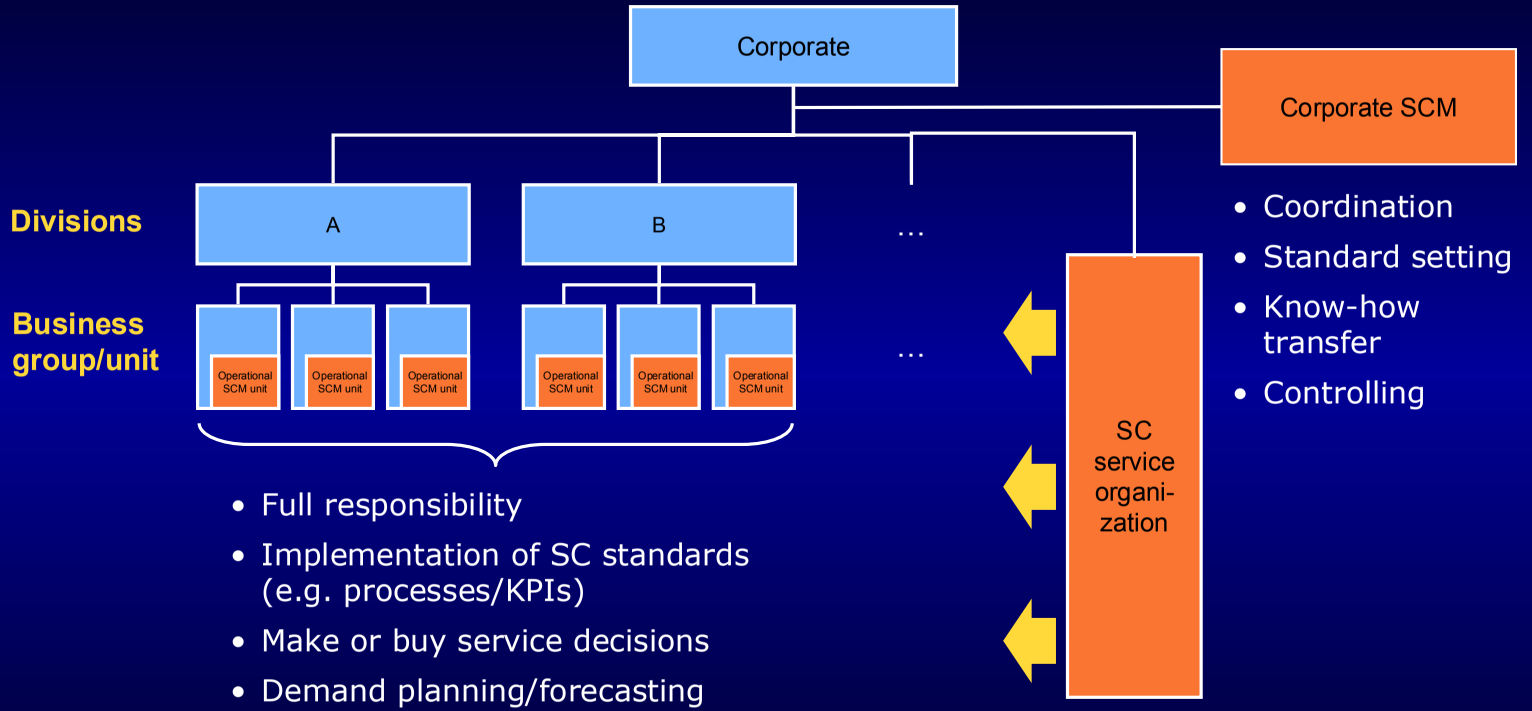
Source: Supply Chain Council, Bain SCM Capability Practice

Study focus

SCM evolution in the chemical industry



SCM organization model 1 – centrally managed decentralization



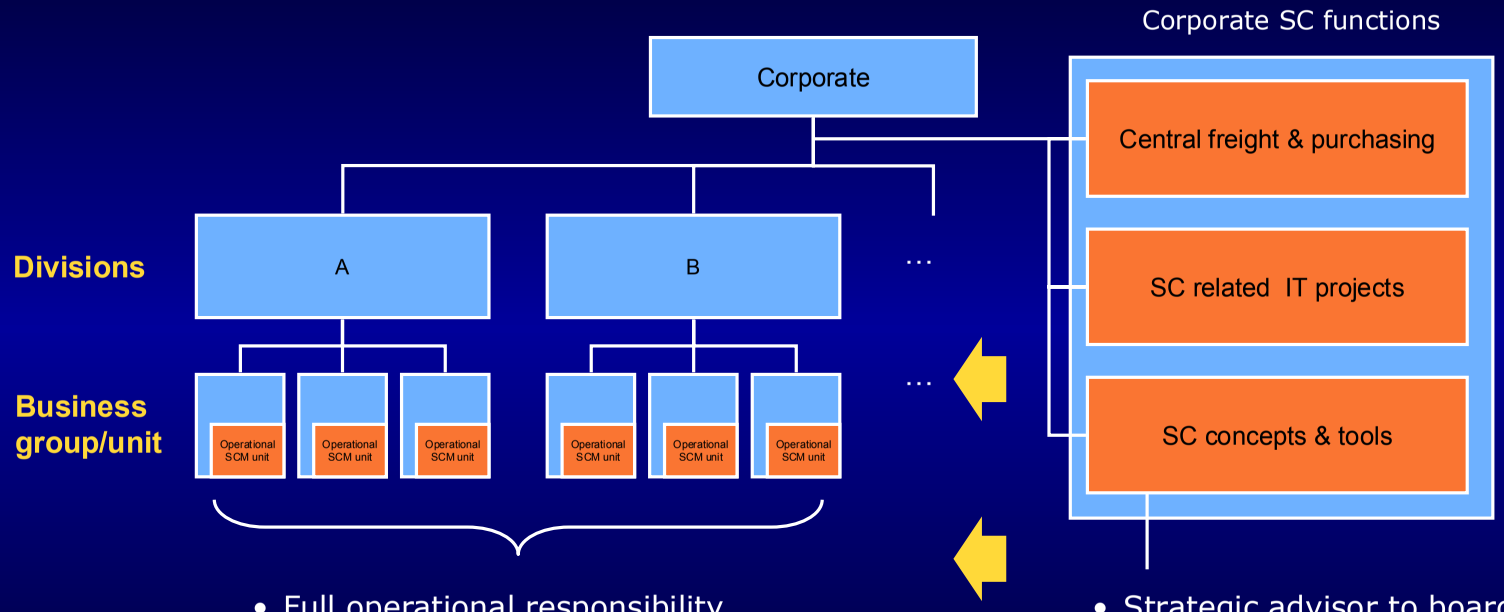
- Coordination
- Standard setting
- Know-how transfer
- Controlling

- Full responsibility
- Implementation of SC standards (e.g. processes/KPIs)
- Make or buy service decisions
- Demand planning/forecasting

- Scale & know-how services
- Market competitiveness
- Service level agreements

SC organizational units

SCM organizational model 2 – centrally supported decentralization

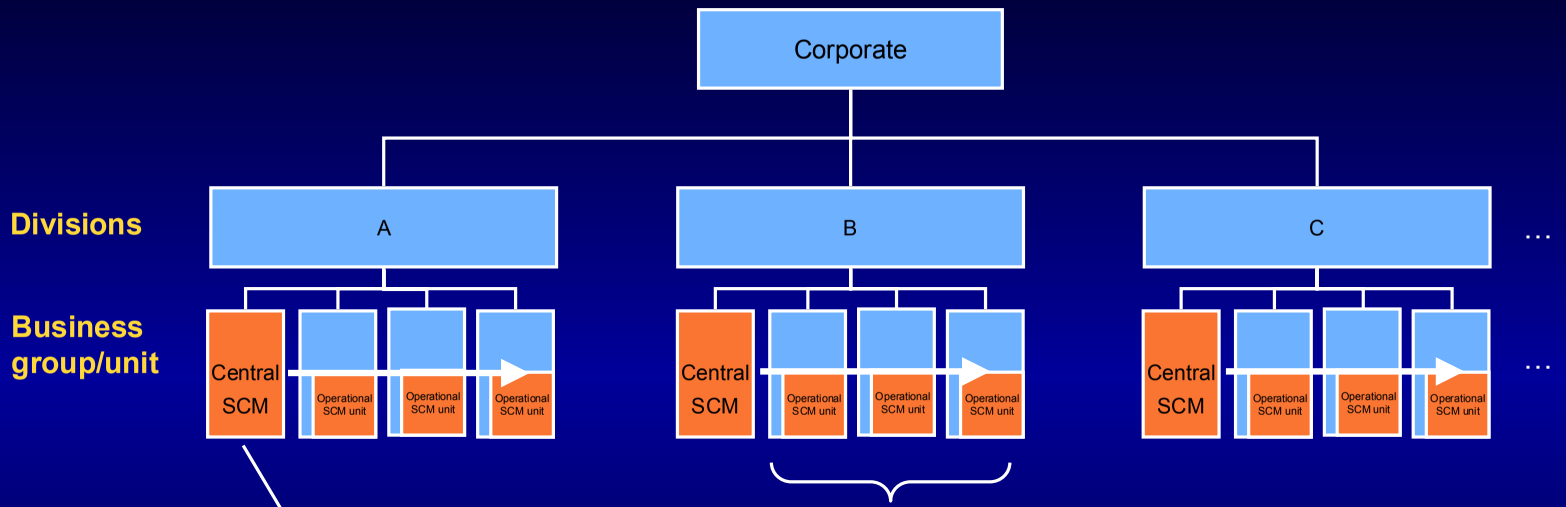


- Full operational responsibility
- Execution of operational SC activities
- Free to adopt central SC initiatives

- Strategic advisor to board
- Consultant to business units
- Knowledge management
- No technical authority over business units

SC organizational units

SCM organizational model 3 – divisionally managed decentralization

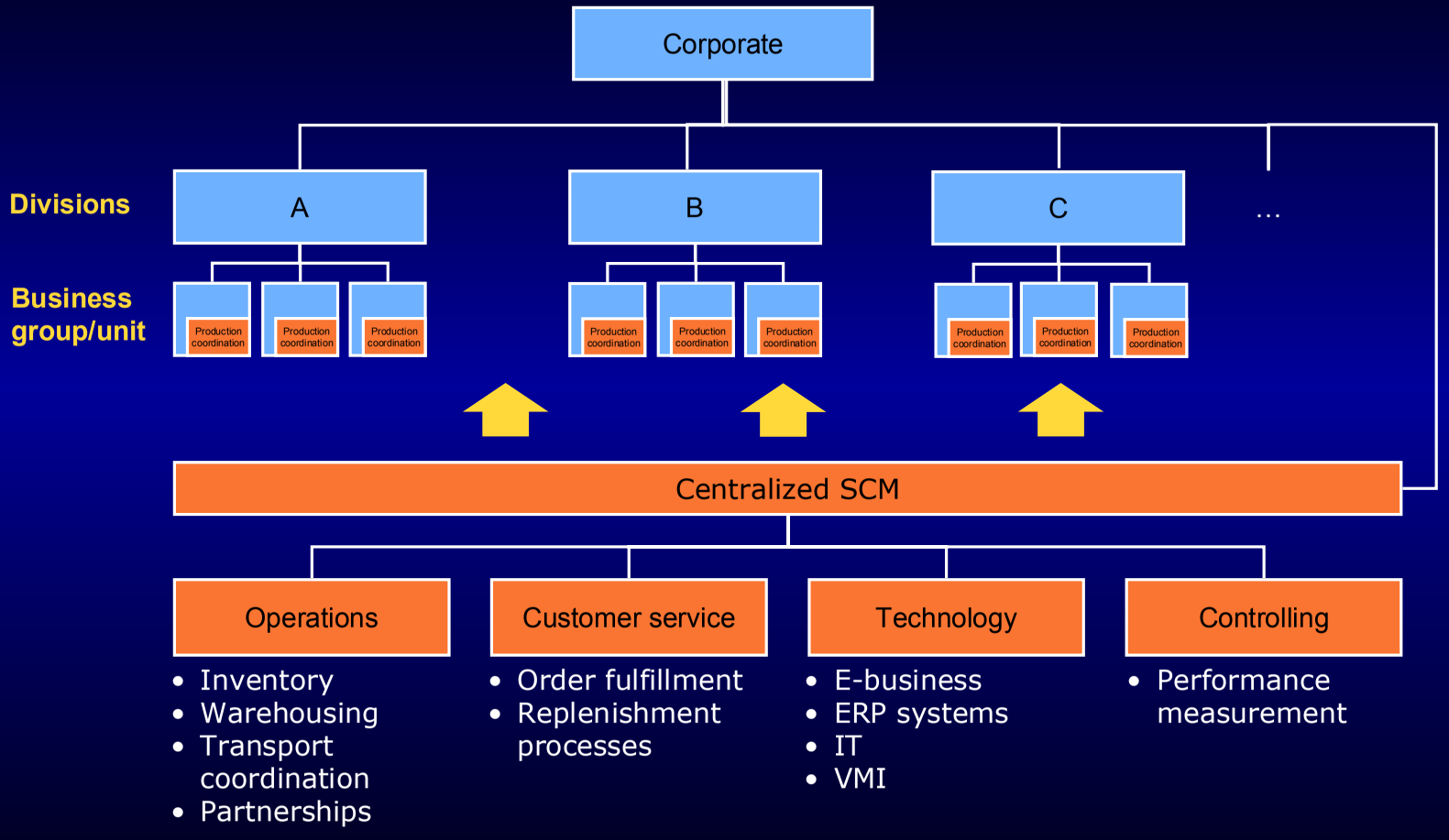


- Standard setting
- Project management
- Controlling
- Processes
- IT projects

- Responsibility for operational SC activities
  - Transport management
  - Warehousing
  - Inventory
- Limited make or buy decisions

SC organizational units

SCM organizational model 4 – centralization



Current SCM initiatives

Cost management + **Service improvement** + **Controlling**

- Freight/transport
  - Partner consolidation
  - Central purchasing
  - Outsourcing
- Inventory
  - Workout programs
  - Planning & forecasting
    - Process standardization
    - SAP tools application
    - Selective CPFR/VMI
  - KANBAN replenishment
- Warehousing
  - Consolidation/downsizing
  - Outsourcing
- Customer service organization consolidation

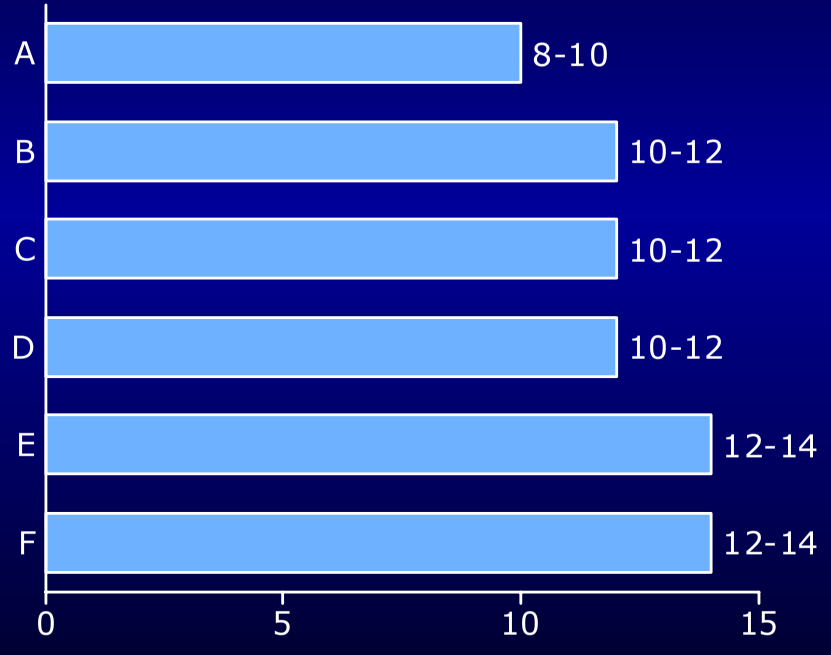
- Order fulfillment process optimization
  - Objectives
    - Delivery date/lead time commitments at order entry
    - Product availability
  - Requirements
    - IT supported online data transparency
    - Consistent responsibilities for data input along value chain

- KPI* system optimization/ implementation
  - Selection/definition
    - Evaluation of status quo
    - Target setting
- KPI performance measurement
  - Financial
    - Total SC cost
    - SC cost categories
  - Non-financial, e.g.
    - Lead time
    - Reliability
    - Delivery quality

* Key performance indicator

SCM cost estimates on average in the 10-12% range of total cost

SCM cost by company (in %)



Issues with SCM cost estimates

- Definition and measurement of cost items vary (e.g. cost of capital for inventory carrying cost)
- Limited SCM cost transparency for SCM units in decentralized organizations (e.g. SC cost allocation for customer service organizations)
- Cost estimates only partially available on either corporate or BU level

Note: Company sequence not identical to alphabetical order in introduction section, cost and VMI sequence not identical

Innovative SCM tools (1/2) – limited application of CPFR until today

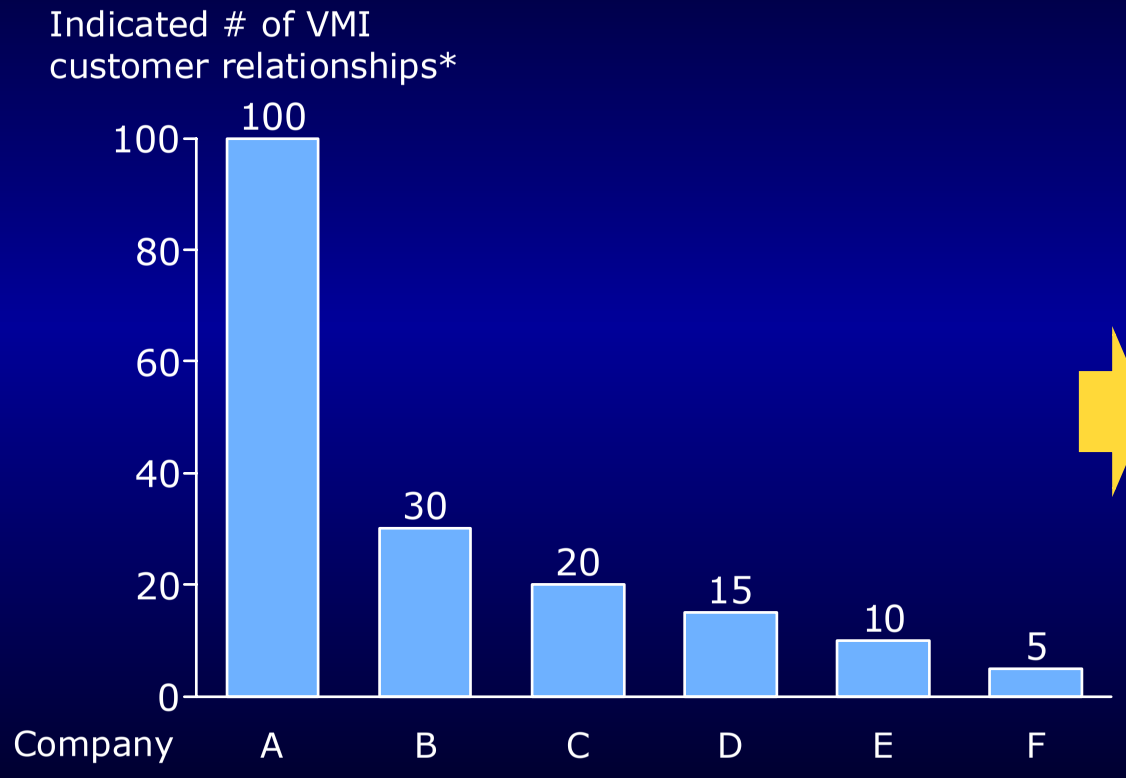
Situation

- CPFR as IT-supported planning tools not or only selectively applied
  - ERP prerequisites not available (supplier and buyer side)
  - No dominant party/player in chemical supply chain to establish standard
- Customer data sharing currently widely practiced without IT tools
- Limited impact of collaborative planning due to weak customer forecasting capabilities

Outlook

- Consistent application of "hands-on" customer data integration
- Focus on SAP planning tools
- Expand use of CPFR on case-by-case basis when connectivity issues are addressed

Innovative SCM tools (2/2) – VMI application with focus on key accounts



- **Best in class companies**
  - **Enforce VMI applications for appropriate clients (key accounts) and products**
  - **Support VMI service sales actively through dedicated technical sales support staff**

* # of installed VMI devices per relationship varies from only 1 to >20
Note: Company sequence not identical to alphabetical order in introduction section, cost and VMI sequence not identical

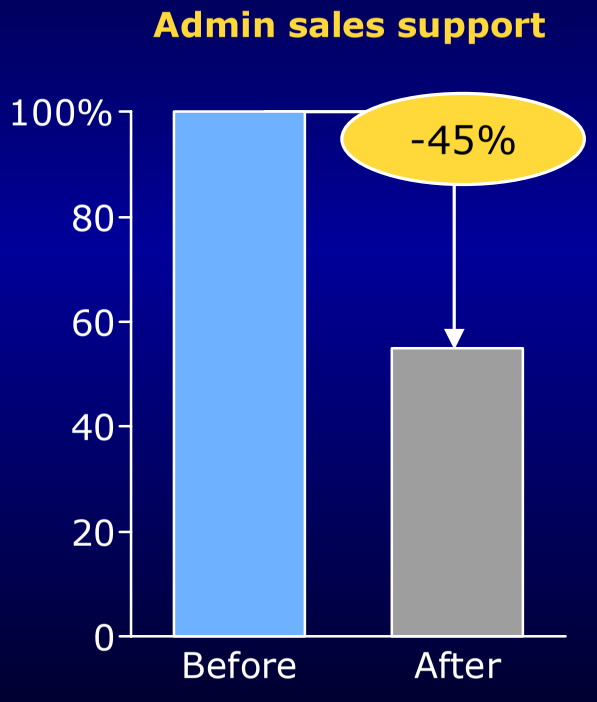
Customer service consolidation phases

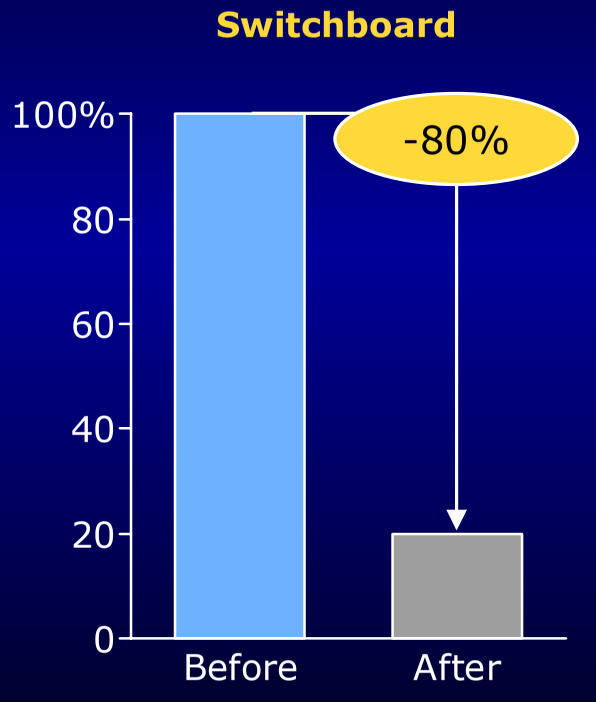
Decreasing degree of consolidation →

	European centralization	European consolidation	Country-based consolidation	No consolidation
Characte-ristics	• One European order desk per business unit/business group • "Localized" central approach - Native speakers - Local service members • Only scale BU/BG with limited dedicated "in-country" staff	• Client service infra-structure established in major European markets • 5-7 locations • Several organizational units share infrastructure	• One order desk per country • Country order desk serves all business units or business groups	• Client service organizations - Per business unit - Per country • Consolidation limited to subscale country organizations (e.g. Benelux)
Consolidation outlook	_____	• No consolidation planned - Language barriers - Country productivity differences - Customer relationships	• European order desk or call center implementation to be evaluated	• Consolidation plans underway

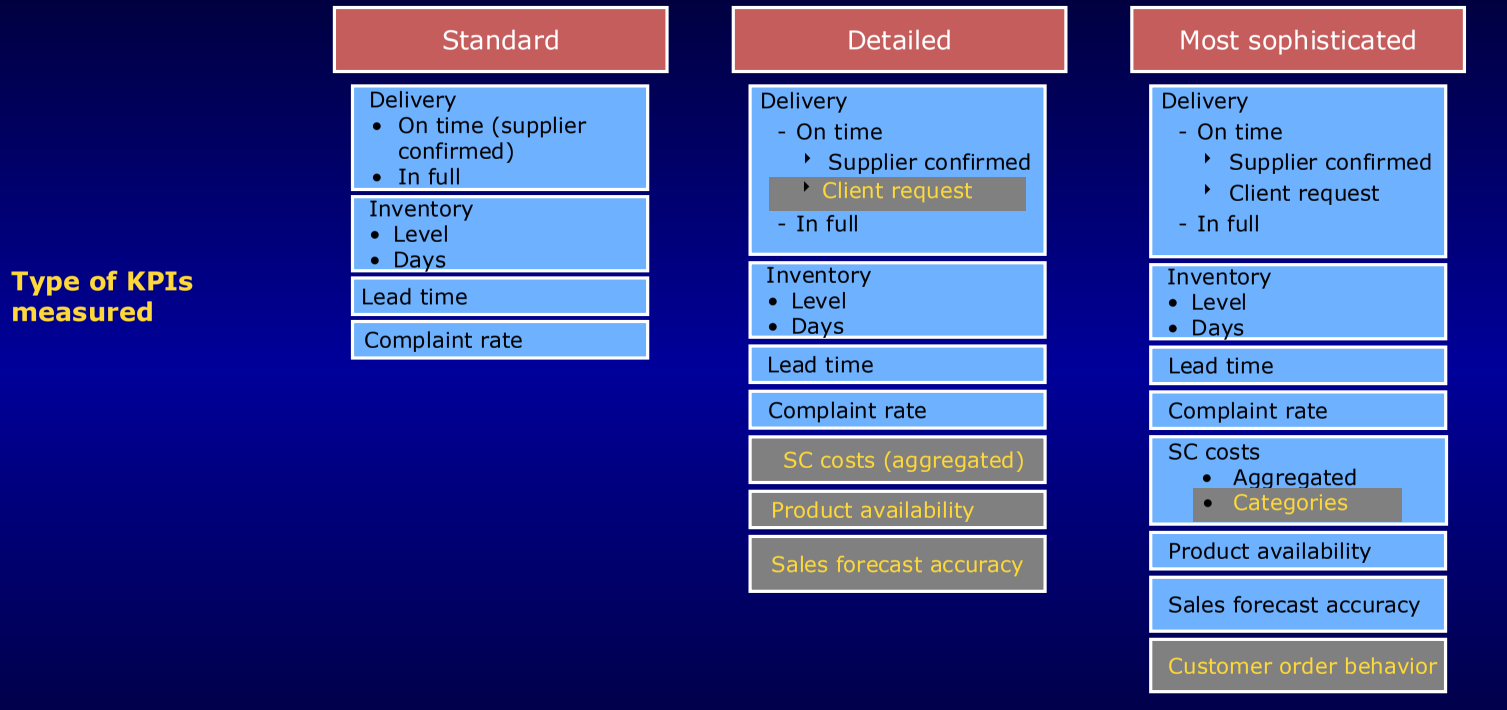
Call center cost savings potential

Example from participating company outside Europe
- headcount savings (in %)





SCM controlling – key performance indicator systems



SCM segmentation often limited to ABC analysis