



Management- und Technologieberatung AG

Automotive Production Network Strategies – Lessons Learned for the Pharma Industry –

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Table of Contents



Automotive Industry Trends

Sourcing Pattern

Supplier Hierarchy

Supplier Selection

Interaction / Cooperation Pattern

Plant Locations

Supply Chain Management

Lessons Learned for the Pharma Industry

Automotive Industry Trends

Automotive production network design can be characterized by the following key statements

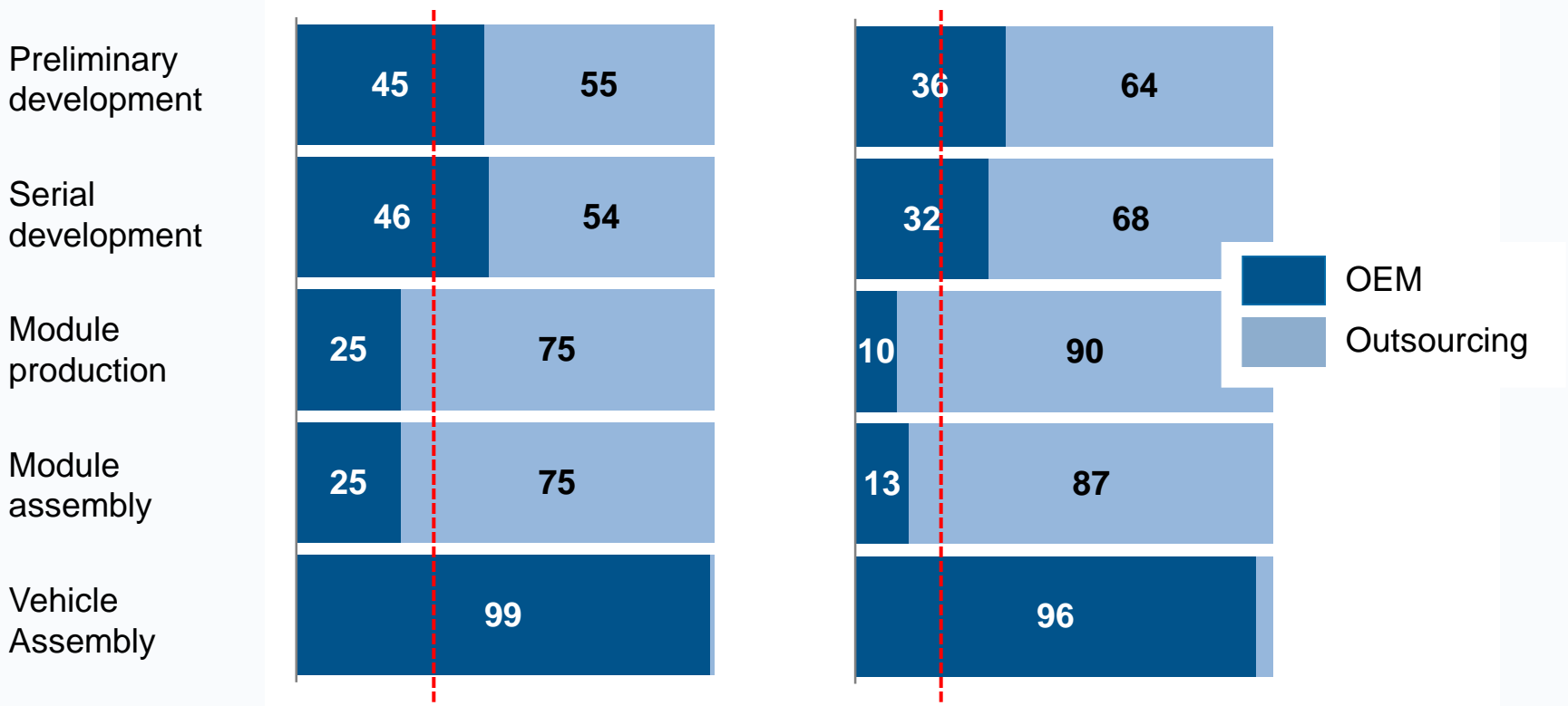
- Mature, highly consolidated industry with world-wide only 12 global market participants in 2005 (down from 21 in 1990)
- Further modularization of the vehicle in complete modules like e.g. chassis, power train, engine, cockpit, front-end
- High degree (77,5% in 2015) of development and production outsourcing of complex systems, sub-systems and modules, components and parts
- Intensive co-operation via strategic alliances, joint ventures as well as mergers and acquisitions
- Build-up of production capacity in low-cost countries to facilitate market access in high growth emerging markets (China, India and Eastern Europe)

Sourcing Pattern (1)

The original equipment manufacturers (OEM) will increase their outsourcing portion to suppliers from 64,7% in 2002 to 77,5% in 2015

Added value by process step in **2002**

in **2015** (in %)



Average

35,3 : 64,7 %

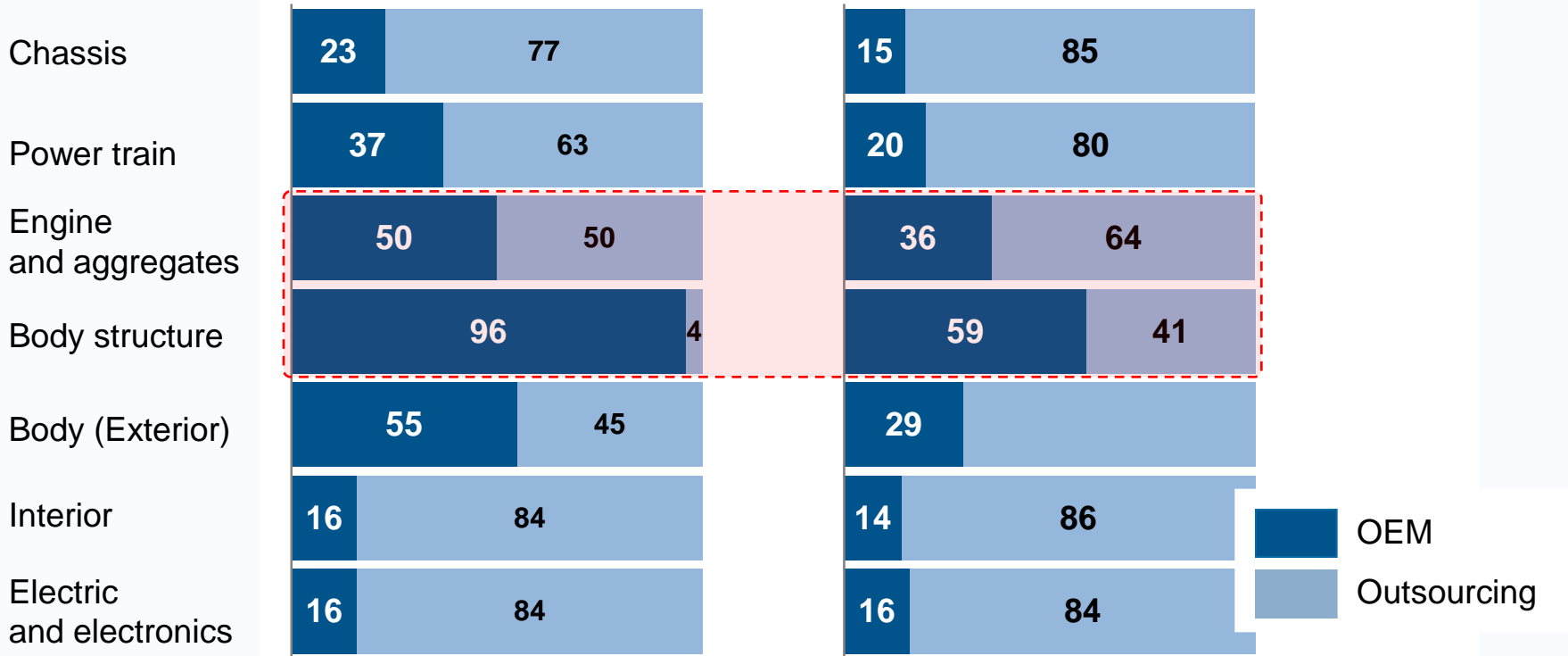
22,5 : 77,5 %

Sourcing Pattern (2)

Internal production is kept for security critical or technological sophisticated components

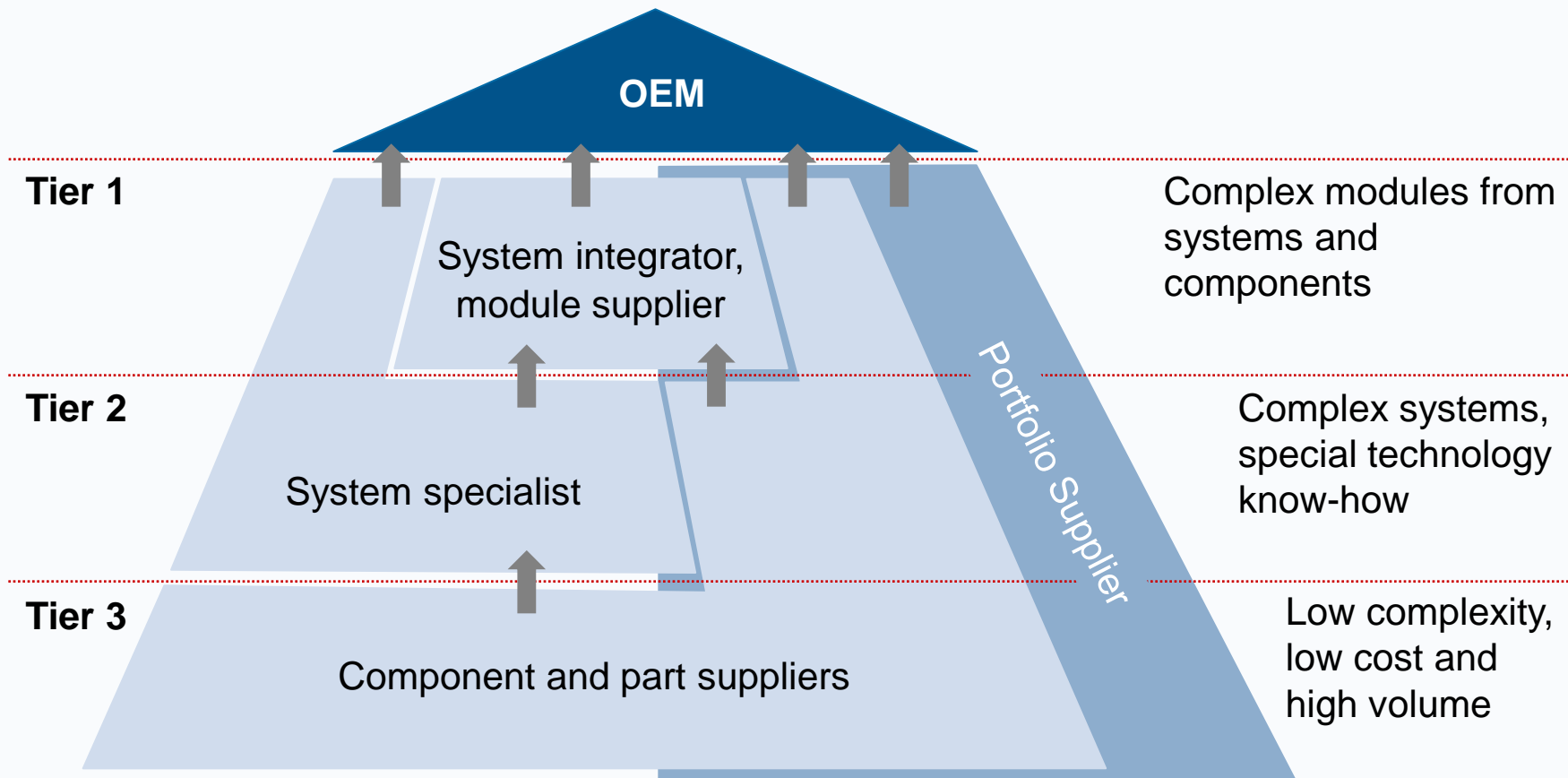
Added value by component in **2002**

in **2015** (in %)



Supplier Hierarchy

Three levels of suppliers are differentiated – portfolio supplier are large companies working across several tiers



Source: nach Kiefer (2005)

Strategic goal is to build a global network based on long-lasting partnerships with a few selected supply partners

- OEMs prefer and rely more and more on systems and module suppliers instead of component and parts suppliers
- Since the OEMs build up production in fast growing emerging markets in order to ease market access suppliers are requested to follow them there
- Top selection criteria for cooperation are key competences, available resources and covered business segments
- To ensure effective communication OEMs focus on cultural fit, comparable value system and social responsibility (code of conduct and ethics)
- The ideal partner is willing to share know-how and has respective reputation – installation and use of international procurement offices (IPOs) is recommended
- Financial stability of future partner as well as country socio-political stability has to be evaluated
- OEM and partner should have common understanding for the importance of product and process quality standards

Interaction / Cooperation Pattern

Trends in the Interaction between OEM and Suppliers (1)



Corresponding to changes in the sourcing pattern interaction between OEM and suppliers will be adapted

Single and dual sourcing strategies by the OEMs

Shifting many production steps to module suppliers implies a dramatic reduction of suppliers to one or two strategic systems / module suppliers

Regional connection of suppliers to OEM plants

In order to fulfill cost, time and flexibility requirements supplier are to be integrated into the local supply chains of the OEM plant ⇒ “suppliers parks”

Transfer of QS tasks to the suppliers

With production of complete system and modules suppliers are responsible for related QS tasks including the risks of product liability and warranty

Growing use of electronic procurement

For purchasing and procurement processes between OEM and suppliers Web-based platforms and market places will replace traditional EDI interfaces

Interaction / Cooperation Pattern

Trends in the Interaction between OEM and Suppliers (2)

Globalization of the supplier markets

Growing competition due to foreign suppliers - in particular Asian – enter local European supplier markets and final car assembly by OEMs abroad

Dramatic reduction of number of suppliers

1st tier supplier from 800 in 2002 down to 35 in 2010
2nd tier supplier from 10.000 in 2002 down to 800 in 2010

From suppliers to “no-name” car manufacturer

Make-to-order production and toll-manufacturing of whole cars is gaining importance, e.g. Magna – Steyr or Karmann produce small series niche cars *

Interaction / Cooperation Pattern

Types of Cooperation (1)

All cooperation types with long-term orientation can be observed

Type	Example	Motivation / Comment
Strategic Alliance	GM, Daimler and BMW Hybrid Development Center Renault and Nissan	<ul style="list-style-type: none"> • Cost and know-how sharing for hybrid technology development • EoS, superior production technology, Asian and US market presence
JV	PSA * and Toyota – car plant in Czech Republic Hella, Behr and Plastic Omnium (HBPO)	<ul style="list-style-type: none"> • Build different small cars on identical platform using key competencies of both partners • Development and production of front-end modules using complementing know-how **
M & A	Mainly financial investors and hedge funds buy suppliers DaimlerChrysler	<ul style="list-style-type: none"> • Economies-of-scale, economies-of-scope as well as market and competition synergies • Merger failed, existing synergy potentials alone do not guarantee their realization

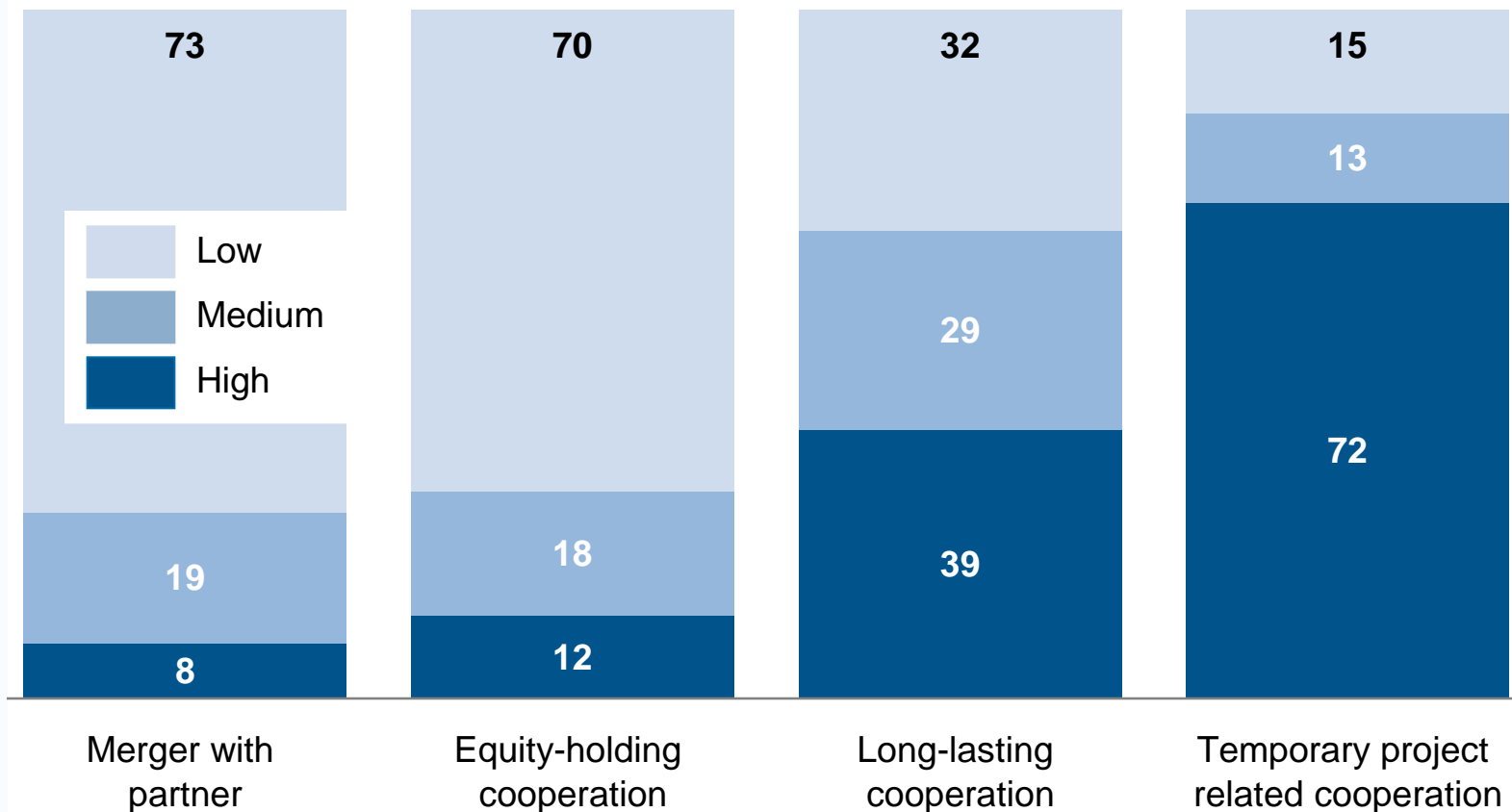
* PSA – Peugeot and Citroen, ** Hella – light and electronics, Behr – cooling system, Plastic Omnium – front-end design

Interaction / Cooperation Pattern

Types of Cooperation (2)

Suppliers clearly prefer cooperation forms without cross-ownership

Importance of cooperation forms for suppliers (in %)



Plant Locations

Build-up of production capacity in low-cost countries to facilitate market access in high growth emerging markets

- Car manufacturers (OEM) will relocate production capacities to low-cost emerging markets with high growth potential
- Local production in emerging markets will
 - facilitate market access by avoiding market entrance hurdles (e.g. import taxes, local content requirements) and
 - fulfill customer needs (e.g. make-to-order, low cost)
- Since OEM have local production, supplier in all tiers have to follow for the same reasons, i.e. market hurdles and customer needs
- E.g. China's automotive industry has developed extensively through foreign direct investment *

* e.g. Bosch doubled investments in China from 2004 onwards, 1999 foundation of Bosch (China) Investment Ltd. to coordinate the investments; Bosch announced in 03/2011 to create 24.000 new jobs in China and thereby double the workforce in China

Sophisticated supply chain management systems are one critical success for the automotive industry

- Cars are build to customer order in a complex production network characterized by many participants in multi-stage supply chain
- To keep inventories low suppliers are requested to deliver components just-in-time to the assembly line
- To manage the complex supply chain the OEM needs full network transparency, preview of bottlenecks and strict SC performance monitoring ...
- ... which can only be achieved with support of an integrated SCM system combining sales planning, order entry and production planning
- ... as well as efficient integration of suppliers and their IT systems

Lessons Learned for the Pharma Industry (1)

Despite obvious differences sourcing developments in the automotive industry can be also a model for the pharmaceutical industry

- The automotive industry has a high maturity level * – which is probably more than 10 years ahead to the pattern in the pharmaceutical industry
- Therefore it can be used as a possible model for the future development of the pharmaceutical industry
- Although there are some major differences between both industries – e.g. strict regulatory environment and high uncertainty of pharmaceutical innovations ...
- ... a further growth of outsourcing in pharmaceutical development and production is also expected over the next 5 – 10 years

* i.e. high concentration to a few global car companies

What trends are transferable to innovative or off-patent pharmacos?

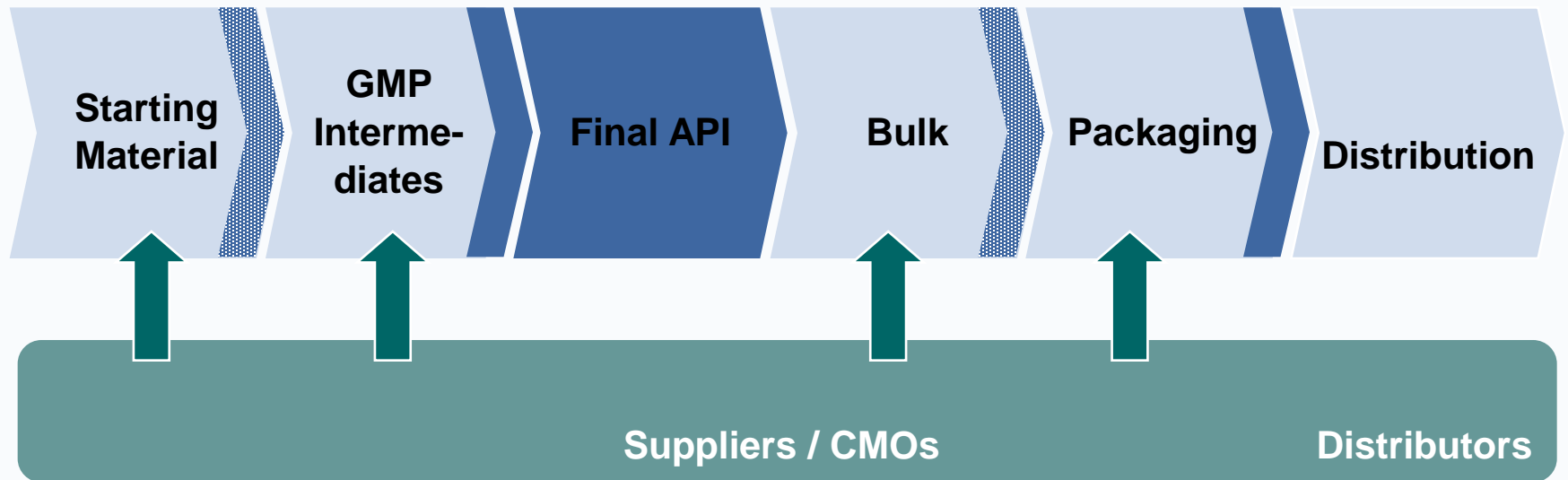
- The automobile OEMs focus on high tech * and final assembly to secure market access, innovation and to control the quality of the market relevant end-product
- Innovative pharmacos ** will be able to follow a comparable sourcing approach ...
- ... and keep patent and registration related production steps of the API as well as QA tasks in-house and outsource most of the remaining tasks
- Off-patent pharmacos *** will be able to use a higher degree of outsourcing and keep only coordination and QA tasks in-house
- In order to retain control over the network that is becoming increasingly complex both groups have to strengthen their SCM capabilities ...
- ... and their supplier selection process should shift from opportunistic outsourcing to long-term partnerships with few strategic suppliers

* Engine and body structure, ** mainly patent protected products, *** generics and OTC

Lessons Learned for the Pharma Industry (3)



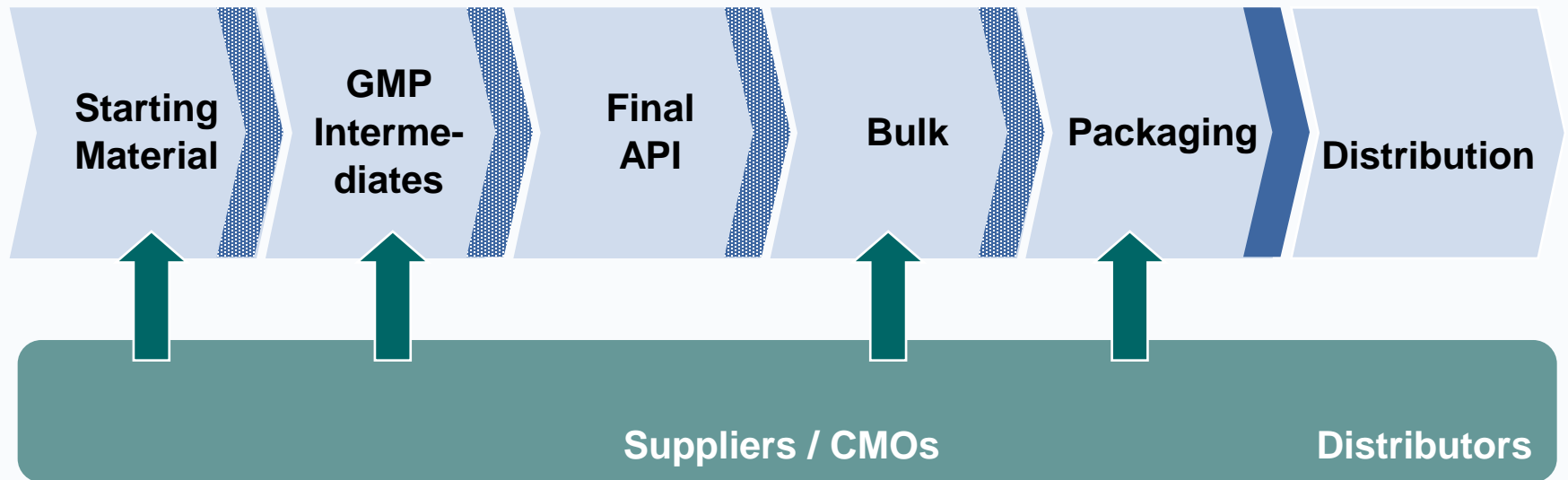
For patent protected drugs registration and patent related production steps as well as QA tasks should be kept in-house



- In-house production steps
- In-house production steps (optional)
- Outsourced production steps

Lessons Learned for the Pharma Industry (4)

For off-patent drugs most production steps can be outsourced and only coordination and QA tasks should be kept in-house



- In-house production steps
- In-house production steps (optional)
- Outsourced production steps

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