Global Logistics Excellence and Best Practices in Pharma: Results from an interview series with 11 large, multinational pharmaceutical companies

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ETH zürich

Global Logistics Excellence and Best Practices in the pharmaceutical industry

Results from an interview series with 11 large, multinational pharmaceutical companies

D MTEC BWI

Felix Friemann, Paul Schönsleben, 2013

Why this benchmarking series was performed…

MOTIVATION

The **competition-free life for drugs is shortening** demanding highly reliable supply chain operations. On the other hand, **cost pressure on enabling functions** like logistics is increasing.

This study should help providing new ideas for Logistics optimization.

APPROACH

We conducted an interview series with 11 of the 20 biggest pharmaceutical according to sales.* One hour interviews were conducted using a semi-structured interview guideline. All interviews were recorded. The interviewees were senior managers and had 14 years experience in Pharma on average. For reasons of validation these survey results were sent to all participants before publication with the request of approval. All results were approved. Please note that values within this study are generally rounded.

*According to 'IMS Health. (2012), "Top 20 global corporations 2012", IMS Health, IMS MIDAS.'

QUESTIONS

What developments do the biggest pharmaceutical companies have to face?	How do the current performance measures look like today and in future?	How is the long-range planning of warehouse capacities performed in the industry?

Global Logistics Excellence and Best Practices in Pharma

0. Benchmarking summary – Implications

1. Trends, future challenges, Emerging Markets
Read what will be important in future

2. Supply Chain structure and performance measurement
Compare your supply chain to others

3. Long-term warehouse capacity planning
Learn how long-term planning is performed

0. Introduction - Interview series conducted by BWI, ETH Zurich

Benchmarking summary

Hypothesis	Conclusion
Since the variance increases in the last steps of the Supply Chain (i.e. higher number of make-ups), warehouse limitations are expected in packaging facilities and distribution centers.	☑ The biggest limitations in storage capacities are encountered in the distribution centers, followed by the warehouses at the packaging centers.
The growing importance of Emerging Markets drives local presence of Supply Chain operations.	☑ Emerging Markets will become more relevant in future and the majority of the companies is already locally operating in some of these markets.
Companies performing extensive planning (e.g. long-term planning of warehouse capacities), have higher service levels and less critical capacities.	☐ Long-range planning of warehouse capacities is not common in the industry, hence the hypothesis cannot be proven.

☑ Affirmed
☒ Rejected
☐ Not proven

Benchmarking summary

Hypothesis	Conclusion
High finished goods inventory DOH drives high customer service level.	☒ A relation between high finished goods inventory and high service levels cannot be shown. In a future study, it may be analyzed whether companies with low inventories outperform in Supply Chain management and therefore also have a high service level.
Companies with higher percentages of outsourced operations encountered less warehouse capacity limitations in the past.	☒ There appears to be no connection between the amount of outsourced operations and storage space limitations. An explanation might be that companies encountering more limitations in the past have increased the percentage of out-sourced operations.

☑ Affirmed
☒ Rejected
☐ Not proven

Benchmarking summary

Additional findings

- **Flexibility, reliability and responsiveness will become more important Supply Chain attributes in the next 10 years.**
  - Pharma could improve these performances by learning from some practices in the automotive industry (e.g. lean concepts and collaboration with suppliers), which the interviewees assess to be the most applicable.

- **There appears to be a trend in Pharma towards an increased outsourcing of operations.**
  - This could represent an answer to acquire additional flexibility needed in the future; outsourcing production and warehouse capacities to external companies can increase the flexibility to respond to market changes.

Benchmarking summary

Additional findings

- **No relation has been found between warehouse utilization and capacity limitations; however the main reason of capacity limitations have been identified to be the temperature requirements of pharmaceutical products.**
  - What matters for storage limitations is not the overall capacity available, but the amount of space at a given temperature. Even if the warehouse utilization is about 70-80%, storage limitations may occur because of space shortages in the required temperature range.

- **Cold chain storages require the longest time when needed to be increased.**
  - The longer time required to increase cold chain capacities may have caused limitations and space shortages in the past in case of unexpected changes in demand.

Benchmarking summary

Additional findings

- **Emerging Markets appear to be the biggest challenge in Pharma in the next 10 years.**
  - Most of the interviewees estimate Emerging Markets to become more important than the traditional markets in future.

- **The main problem for Pharma in Emerging Markets is the increase of local regulations.**
  - Most of the companies are already operating in some of these markets; their local presence and market knowledge may be an answer to the increasing regulatory requirements.

Benchmarking summary

Conclusions

- Future trends like the growing importance of Emerging Markets will increase uncertainties in the pharmaceutical Supply Chain.
- Flexibility, reliability and responsiveness should be increased according to the interviewees.
- Long-range warehouse capacity planning based on pallet spaces is not performed in the industry.

Data available in the companies that is used for planning production capacities is currently not used for planning warehouse capacities on the basis of pallet spaces. The reasons for this vary. Some managers prefer to increase flexibility by using external capacities, others feel uncomfortable facing the complexity.

The study exposes future trends, benchmarks current supply chain setups and analyses the planning processes to help aligning supply chain capabilities to future needs.

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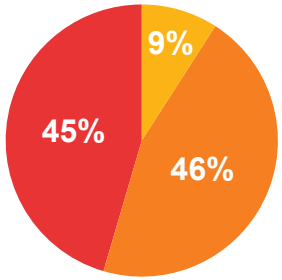
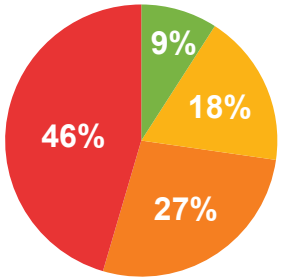
Trends and future challenges

Main challenges in the pharmaceutical industry within the next 10 years

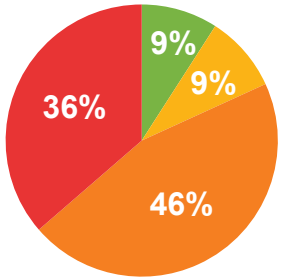
1. Growing of emerging markets



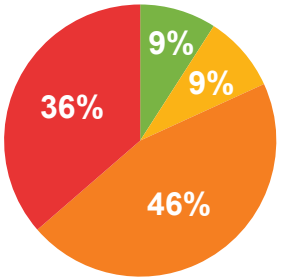
2. Personalized medicine



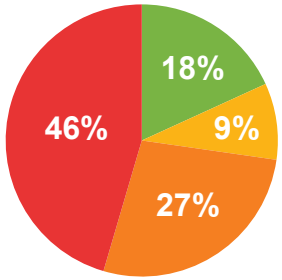
2. Anti-counterfeit measure



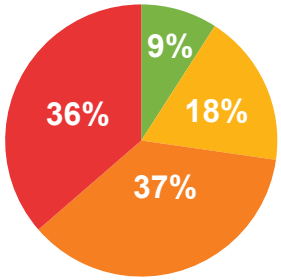
2. Increase cost pressure



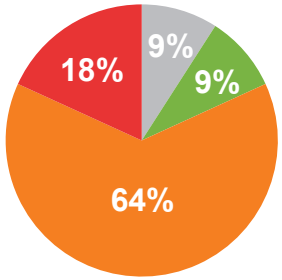
3. Increasing cooling requirements and capacities



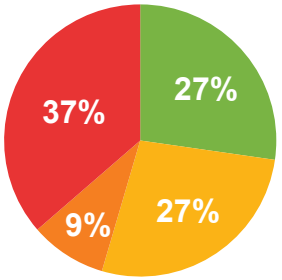
3. Ambient temperature control



4. Requirements for segmented Supply Chain



5. Serialization



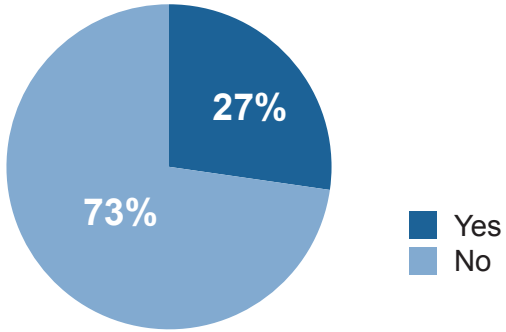
The main challenge within the next 10 years is the growth of Emerging Markets; serialization and requirements for segmented Supply Chains do not appear to be a main problem.

- Will be a big challenge
- Will be a challenge
- May be a challenge
- Not a challenge
- Not a trend

Facing stronger regulation of CRT products

How companies respond to stronger regulations on Controlled Room Temperature (CRT) products

Is there a common approach adopted for the entire product portfolio?



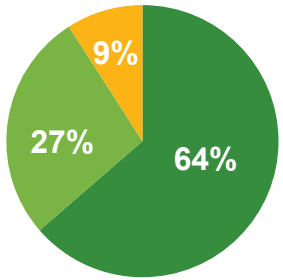
YES	■ Same Supply Chain structure used for the whole portfolio ■ Standardized approach for the entire portfolio
NO	■ Different approaches based on: ● Transportation mode ● Temperature range ● Local regulation

Industries Pharma can learn from

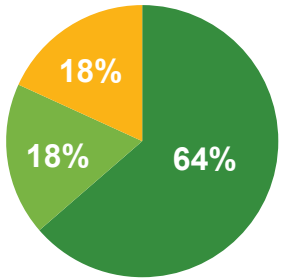
Industry concepts potentially applicable in the pharmaceutical industry

1. Lean concepts

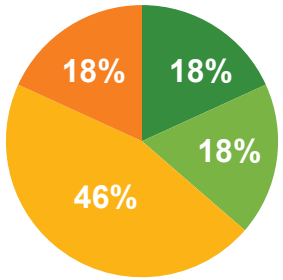
Automotive



2. Collaboration with suppliers

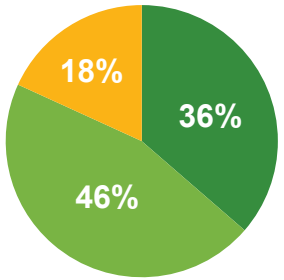


8. Inventory levels

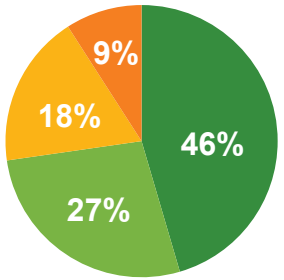


3. VMI approaches

Retailers

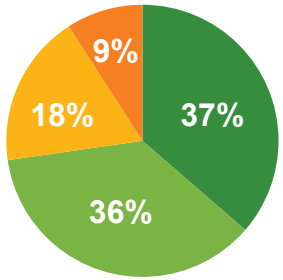


4. Transparency (data exchange)



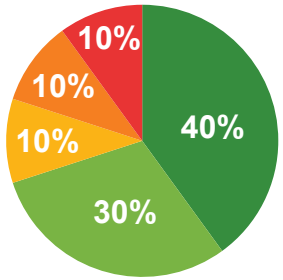
5. Efficient production process

Food industry



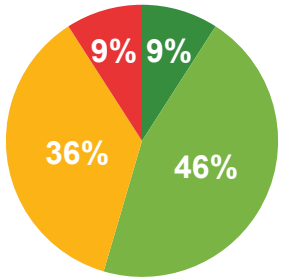
6. Master Data Management

On-line business



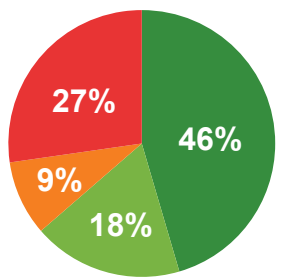
7. Reliability

Food industry



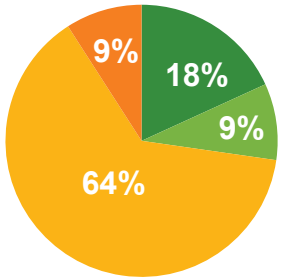
7. Regulation, Risk Management

Airlines



8. Outsourcing

Hi-Tech electronics



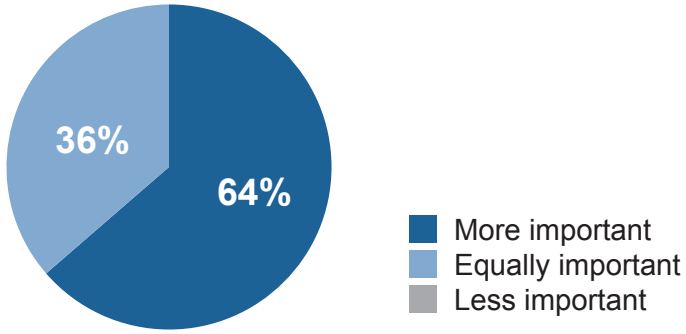
Pharma might learn from the automotive industry in terms of lean concepts and collaboration with suppliers; concepts for managing inventories seem difficult to adapt.

- Very applicable
- Applicable
- In part applicable
- Not applicable
- Non performing better than Parma

Importance of Emerging Markets

Importance of Emerging Markets compared to traditional markets

Future importance



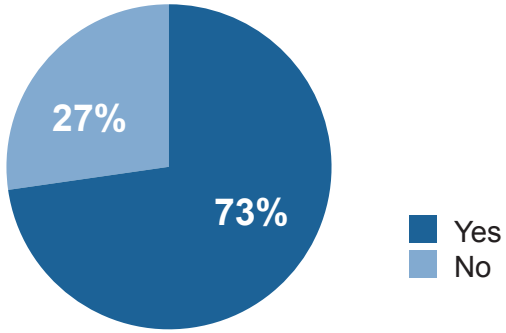
Countries considered as Emerging Markets

- **BRIC (Brazil, Russia, India, China)** (mentioned by 100% of the companies)
- Africa (mentioned by 36% of the companies)
- Middle East (mentioned by 18% of the companies)
- Latin America (mentioned by 18% of the companies)
- Eastern Europe (mentioned by 18% of the companies)

Importance of collaboration in Emerging Markets

Importance of collaboration with local partners in Emerging Markets

Is it especially important to collaborate with local partners?

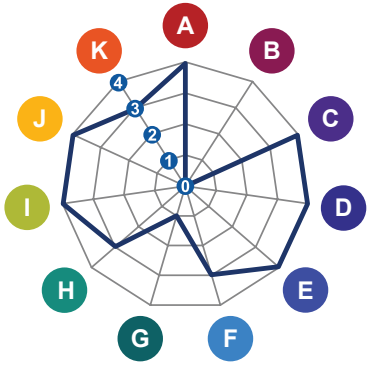


YES, because	■ Joint venture and local partnership ■ Governments promote local partnerships ■ Gain market knowledge ■ Access to distribution and marketing channels
NO, because	■ Same importance as other markets

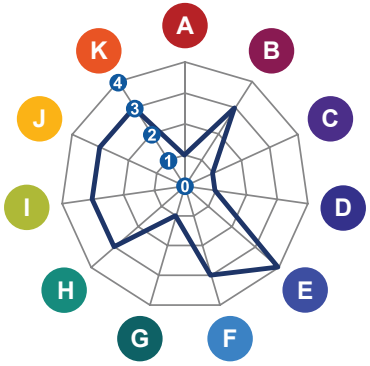
Best Practice concepts for Emerging Markets (EM)

Policies and measures applied in Emerging Markets (EM)

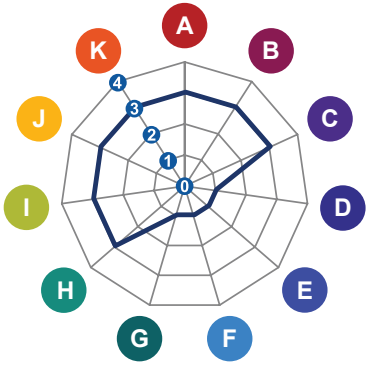
1. Different pricing strategies



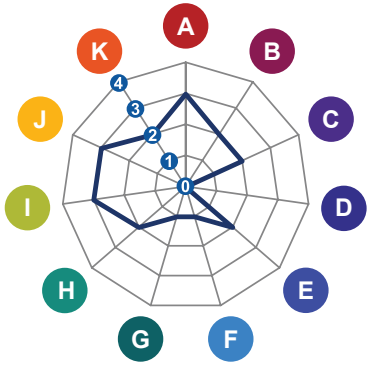
2. Local make-ups



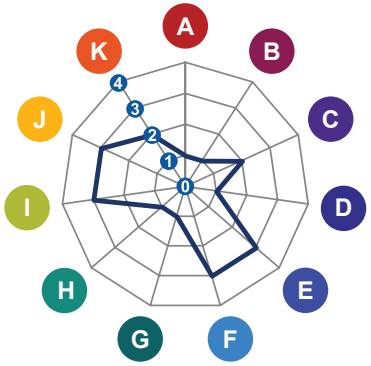
3. Local products



4. Healthcare applications



4. Second brands



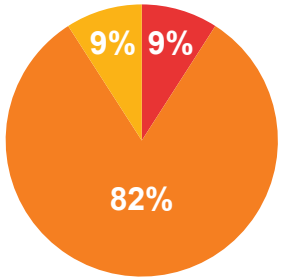
4 applied in all EM
3 applied in some EM
2 planned to apply in future
1 not applied
0 not disclosed

Besides different pricing strategies, also local make-ups (e.g. pack size) and products (e.g. formulations) are becoming more important in EM.

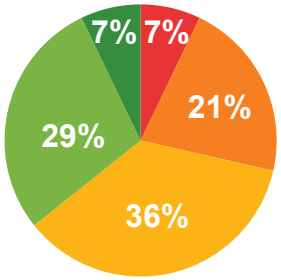
Top challenges in Emerging Markets

Critical issues to be addressed in Emerging Markets

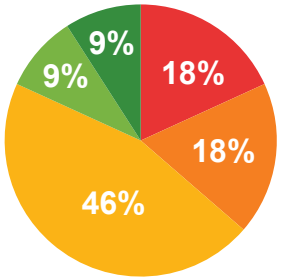
1. Increasing regulatory requirements



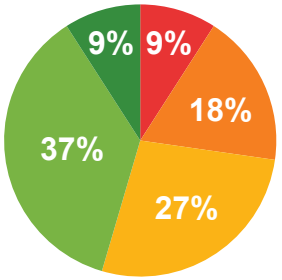
2. Qualified personnel



3. Patent protection



4. Product supply



The top challenge in Emerging Markets are increasing regulations, whereas the product supply is not particularly critical.

- Highly critical in all markets
- Critical in all markets
- Critical in some markets
- Partly critical in some markets
- Not critical

Local production in Emerging Markets

Stages in which production is operated locally in the Emerging Markets

	Drug Substance Production	Drug Product Production	Packaging	Distribution center
A	Planned	Locally in EM	Locally in EM	Locally in EM
B	Locally in EM	Locally in EM	Locally in EM	Locally in EM
C	Not planned	Locally in EM	Locally in EM	Locally in EM
D	Not planned	Not planned	Not planned	Locally in EM
E	Not planned	Locally in EM	Locally in EM	Locally in EM
F	Not planned	Not planned	Locally in EM	Locally in EM
G	Not planned	Not planned	Locally in EM	Locally in EM
H	Locally in EM	Locally in EM	Planned	Locally in EM
I	Not planned	Locally in EM	Locally in EM	Locally in EM
J	Not planned	Locally in EM	Locally in EM	Locally in EM
K	Not planned	Not planned	Not planned	Not planned

Final Customer

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SCOR model – performance attributes

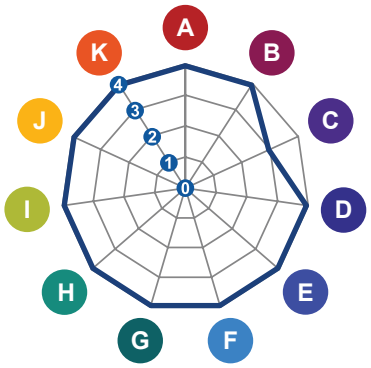
The Supply Chain Operations Reference (SCOR) model

Supply Chain Reliability	The performance of the Supply Chain in delivering: the correct product, to the correct place, at the correct time, in the correct condition and packaging, in the correct quantity, with the correct documentation, to the correct customer. Level 1 Metrics: Perfect Order Fulfillment
Supply Chain Responsiveness	The speed at which a Supply Chain provides products to the customer. Level 1 Metrics: Order Fulfillment Cycle Time
Supply Chain Flexibility	The agility of a Supply Chain in responding to marketplace changes to gain or maintain competitive advantage. Level 1 Metrics: Upside Supply Chain Flexibility, Upside Supply Chain Adaptability, Downside Supply Chain Adaptability
Supply Chain Costs	The costs associated with operating the Supply Chain. Level 1 Metrics: Supply Chain Management Cost, Cost of Goods Sold
Supply Chain Asset Management	The effectiveness of an organization in managing assets to support demand satisfaction. This includes the management of all assets: fixed and working capital. Level 1 Metrics: Cash-to-Cash Cycle Time, Return on Supply Chain Fixed Assets, Return on Working Capital

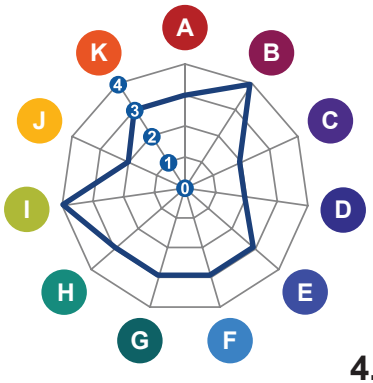
Performance indicators in the Supply Chain

Assessment of the performance attributes

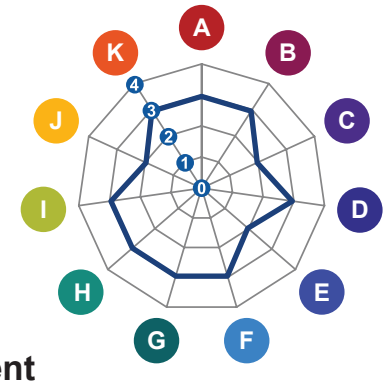
1. Reliability



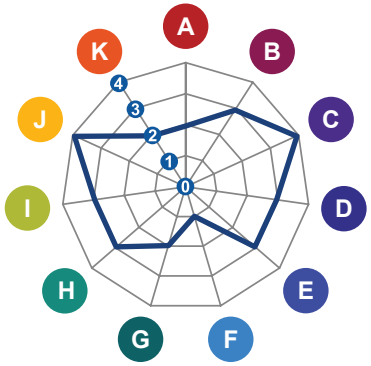
2. Responsiveness



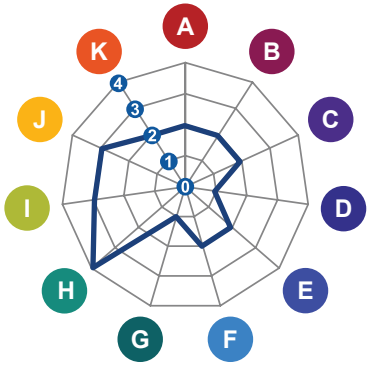
3. Flexibility



3. Costs



4. Asset Management



4 very high priority
3 high priority
2 priority
1 less priority
0 not important

The most important Supply Chain performance indicator is reliability; asset management is generally not a crucial attribute for Supply Chain managers.

Most used KPIs in Supply Chain

KPIs mostly used to define Supply Chain performance attributes

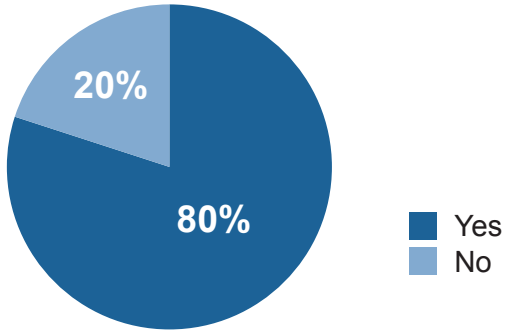
Supply Chain Reliability	■ Service Level ■ On Time in Full, Order fulfillment
Supply Chain Responsiveness	■ Order fulfillment cycle time ■ Master Production Schedule adherence
Supply Chain Flexibility	■ Inventory levels
Supply Chain Costs	■ Logistics costs ■ Cost of goods sold
Supply Chain Asset Management	■ Inventory turnover ■ Return on fixed assets

Most used KPIs in the Supply Chain

Most used KPIs

Most important KPIs for Supply Chain managers		
Customer service level	**Logistics costs**	**Inventory metrics** (inventory turnover, inventory costs, DOH)

Will the KPIs change in the next 10 years?



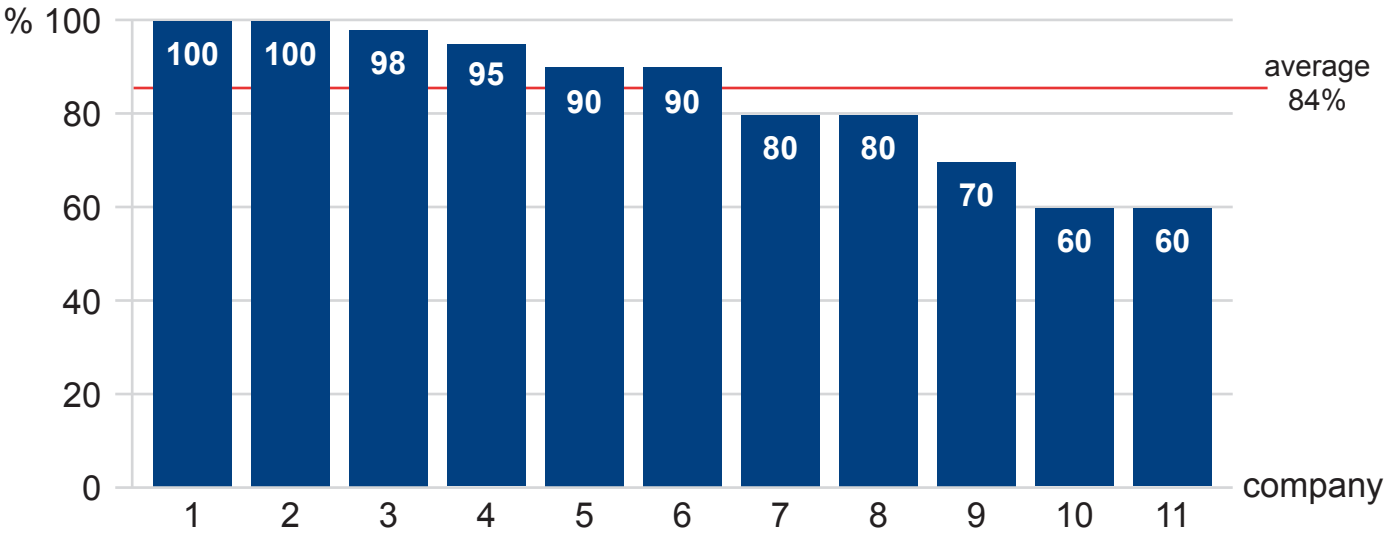
Performances that will become more important.

If the KPI's change, the following indicators were estimated to become more important:

- Flexibility (mentioned by 27% of the companies)
- Reliability (mentioned by 18% of the companies)
- Responsiveness (mentioned by 18% of the companies)

Current percentage of patented products

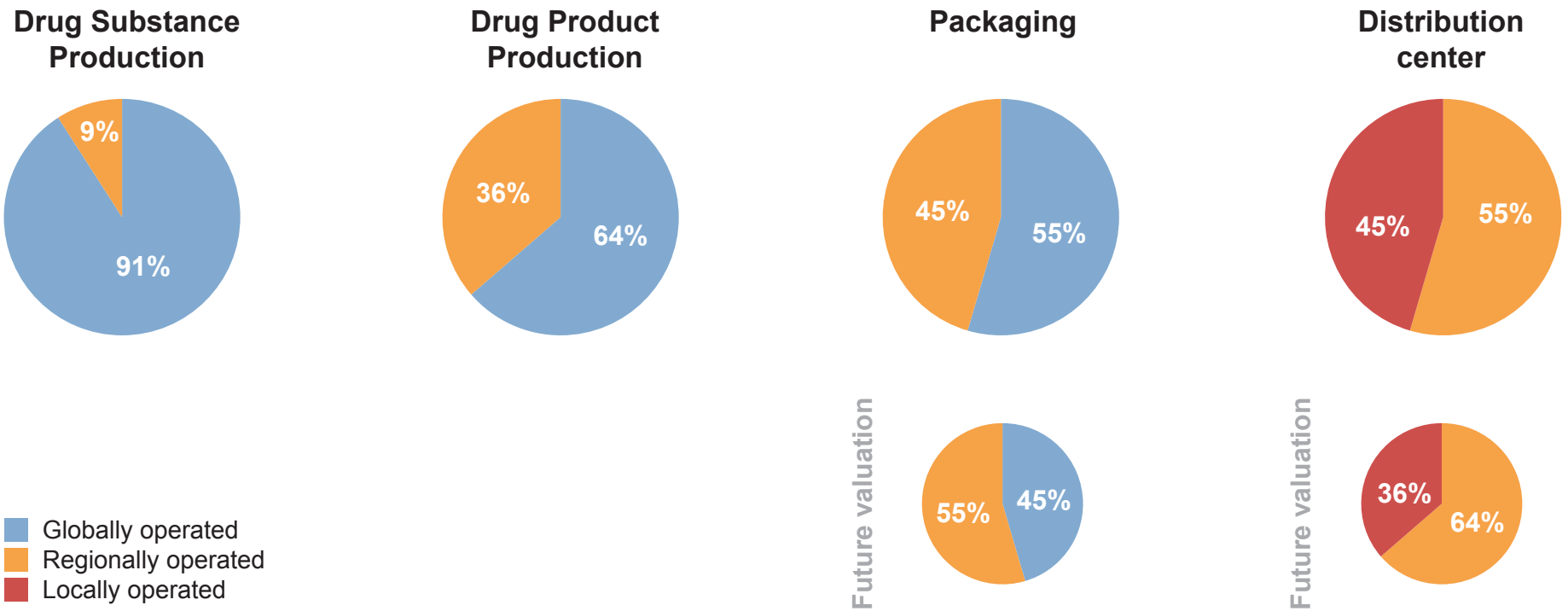
Percentage of patent-protected products (in terms of sales) and future trend



Will the situation change in the next 10 years?

Current Supply Chain structure – overview

Stages of the Supply Chain operated on a global, regional or local level

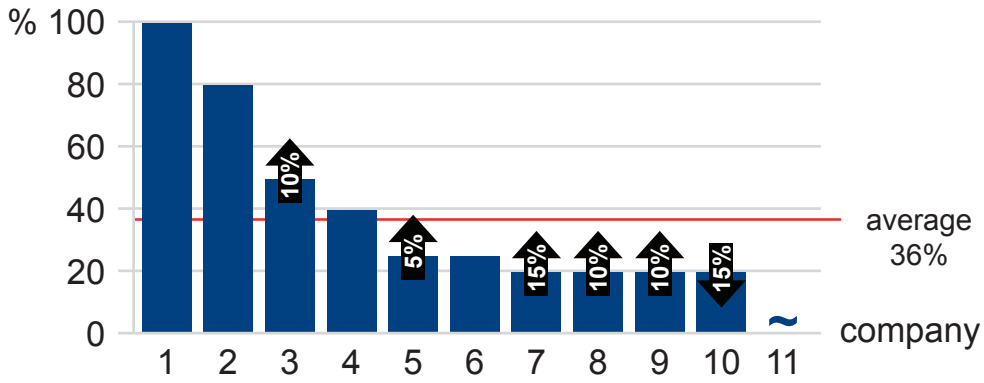


Currently drug substance production is nearly entirely operated globally, the intermediate stages of the Supply Chain are operated globally or regionally and the distribution centers are operating regionally or locally.

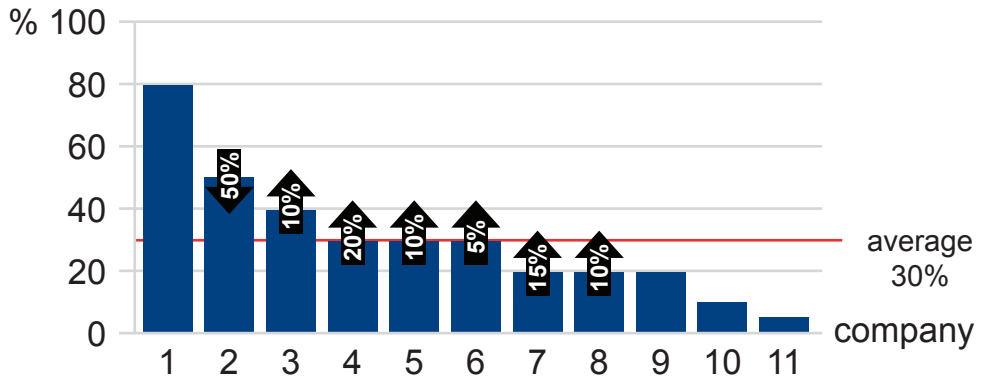
Current level of outsourcing

Percentage of outsourced operations in the various stages of the Supply Chain and future targets (in terms of volume)

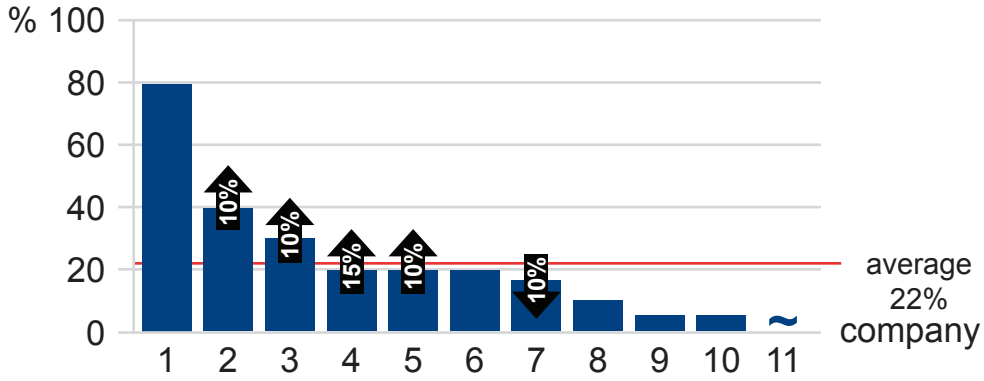
Drug Substance Production



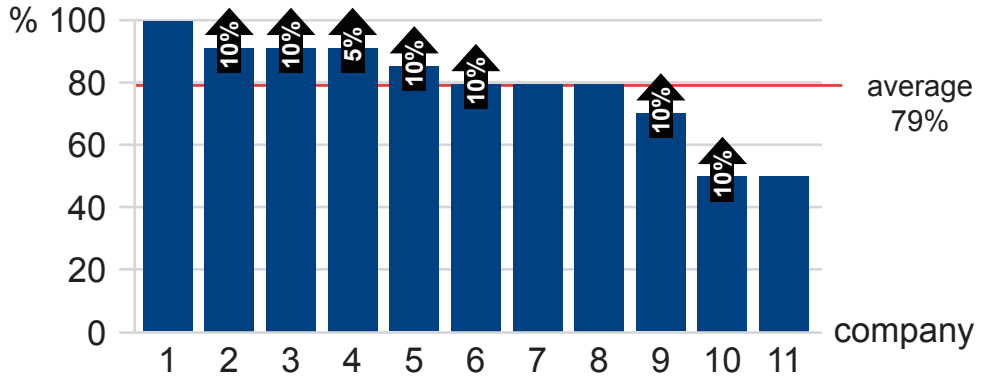
Drug Product Production



Packaging



Distribution center



X% : change expected in future in pp

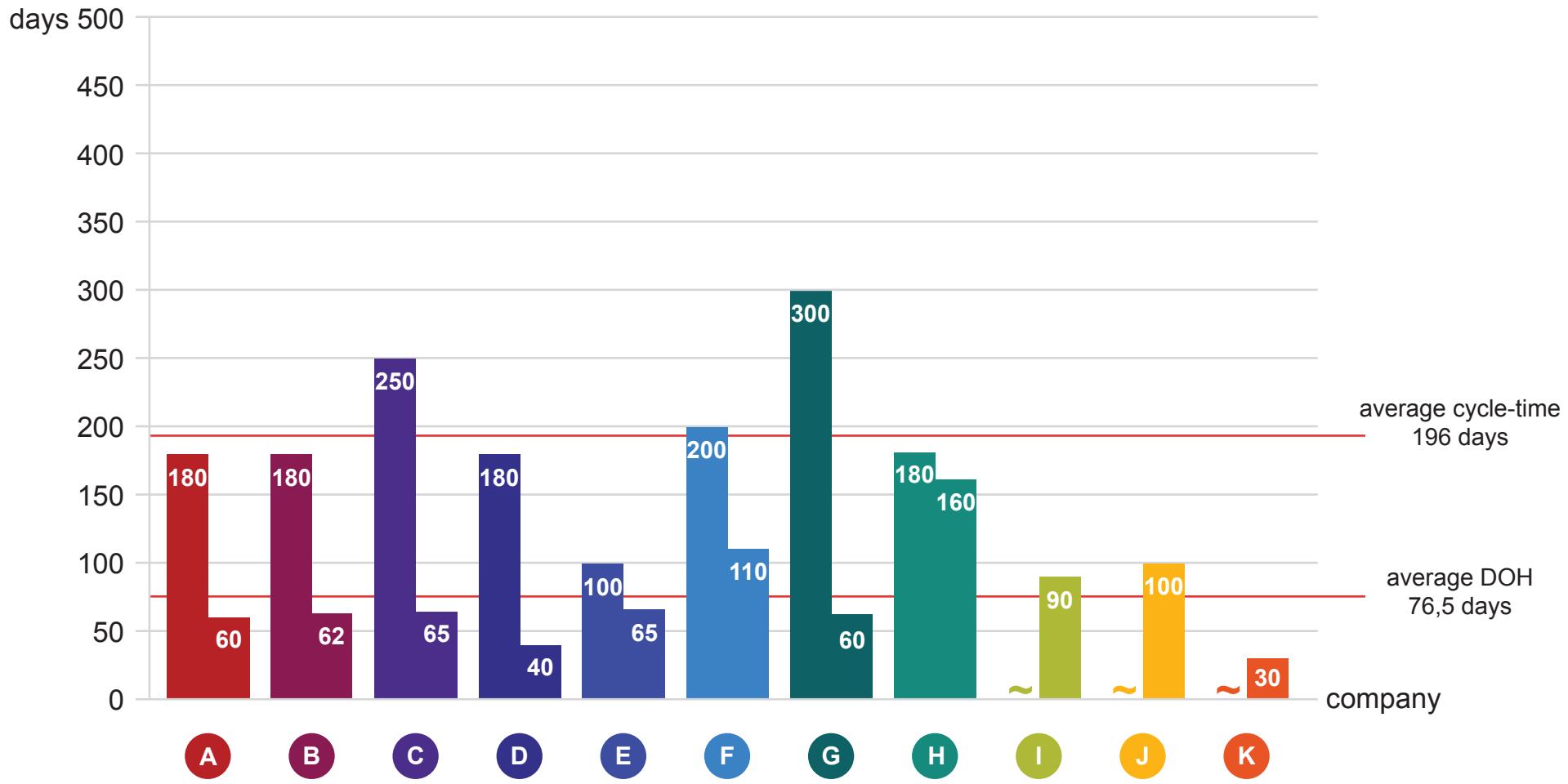
Outsourcing reasons

Most mentioned reasons for outsourcing

Strategic decision	■ Decide based on strategic importance of the product
Not core competence	■ Outsource when the operation is not a core competence
Risk mitigation	■ Outsource production and distribution to ensure supply and increase flexibility
External know-how	■ Outsource when internal competence is not available

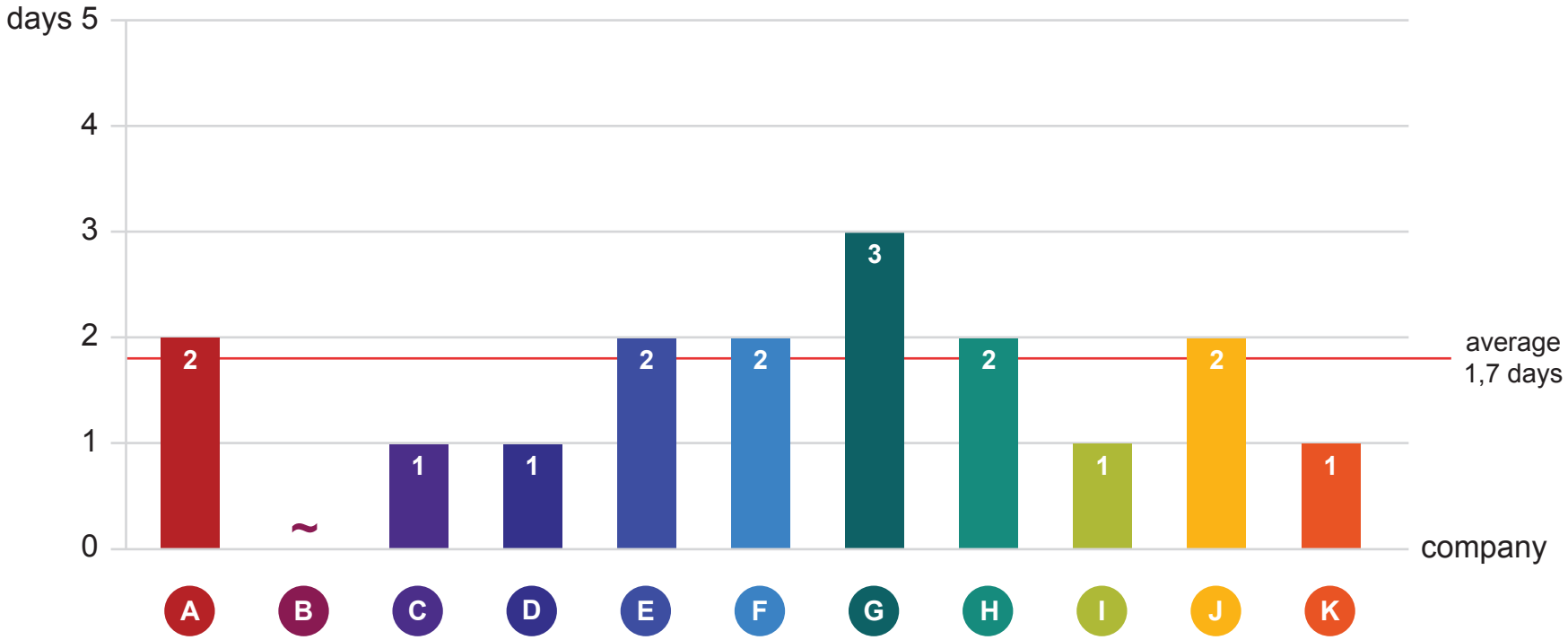
Current cycle-time and inventory DOH

Average cycle-time from Drug Substance Production to Distribution center and average finished goods inventory Days-On-Hand



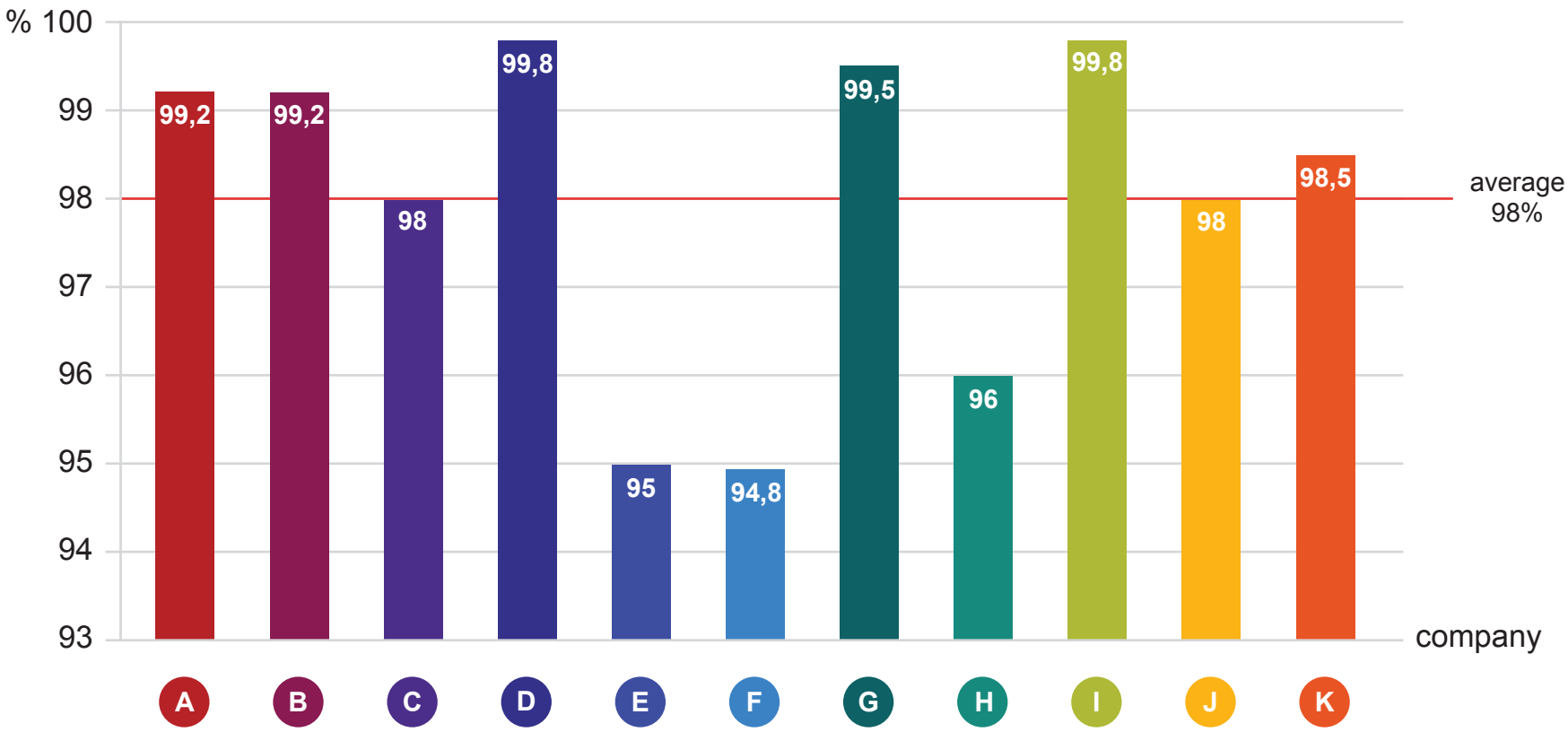
Average order-to-delivery time

Average order-to-delivery time across all distribution channels



Average service level

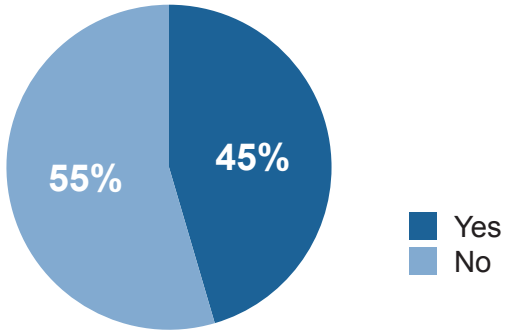
Average service level across all distribution channels



Differentiation of service level targets

Applied approach for the product portfolio (service level targets)

Are the service level targets the same for the whole portfolio?

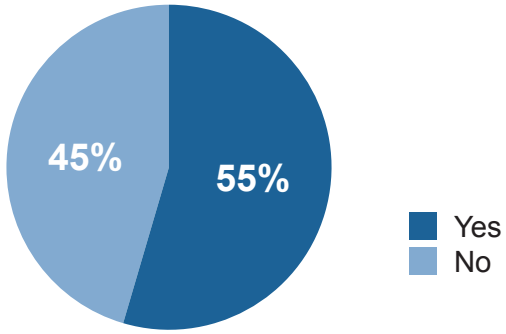


YES, because	■ Homogeneity
NO, because	■ Different targets according to: • product group • country • product/market

Distribution approach

Approach adopted for distribution

Do you follow the same approach for your distribution?



YES	■ Common approach: driven by proximity to markets
NO	■ Different approaches according to • country specifications • public authority's regulations

Global Logistics Excellence and Best Practices in Pharma

0. Benchmarking summary – Implications

1. Trends, future challenges, Emerging Markets
Read what will be important in future

2. Supply Chain structure and performance measurement
Compare your supply chain to others

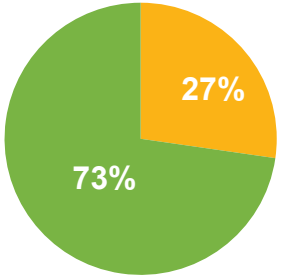
3. Long-term warehouse capacity planning
Learn how long-term planning is performed

0. Introduction - Interview series conducted by BWI, ETH Zurich

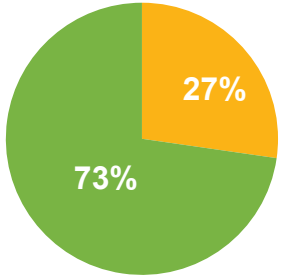
Warehouse capacity limitations - overview

Warehouse capacity limitations encountered in the past

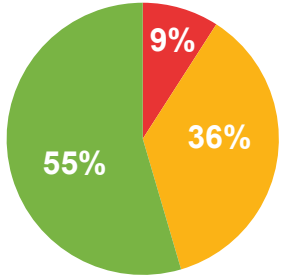
Drug Substance Production



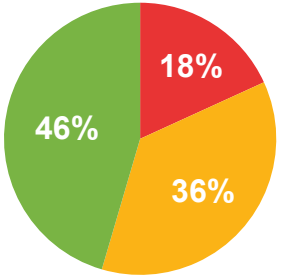
Drug Product Production



Packaging



Distribution center



Average warehouse utilization across the Supply Chain:
ø 80,5 %

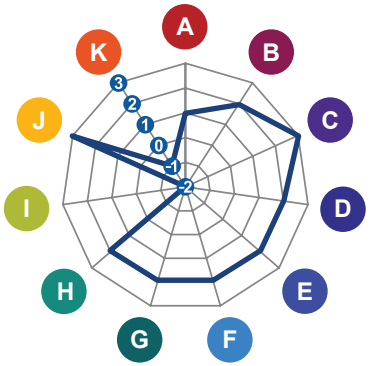
The most critical warehouses in the network are those at the distribution centers followed by those at the packaging facilities; drug substance and product production stages are less restrictive.

- Not critical
- Critical
- Highly critical

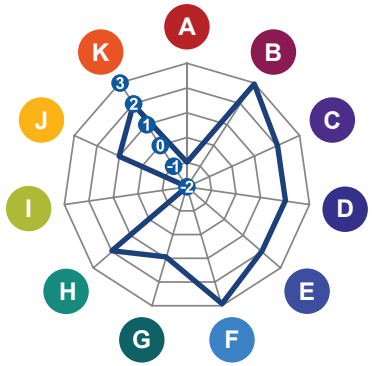
Warehouse capacity limitation reasons

Identified reasons for limited warehouse capacity

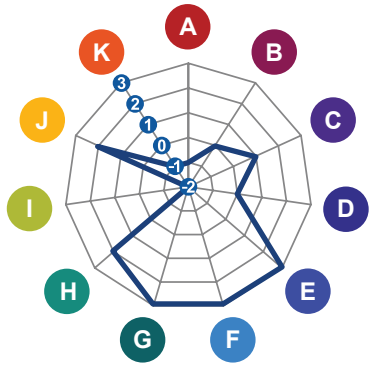
1. Temperature requirements



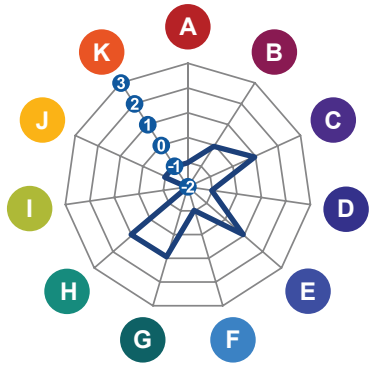
2. Internal/External capacities



3. Geographical region



4. Value of the products



The temperature requirements of products result to be the main reason of warehouse capacity limitations.

3 strongly agree
2 agree
1 partly agree
0 not sure
-1 disagree
-2 not disclosed

Long-range warehouse capacity planning

Definition of long-range warehouse capacity planning used in this study

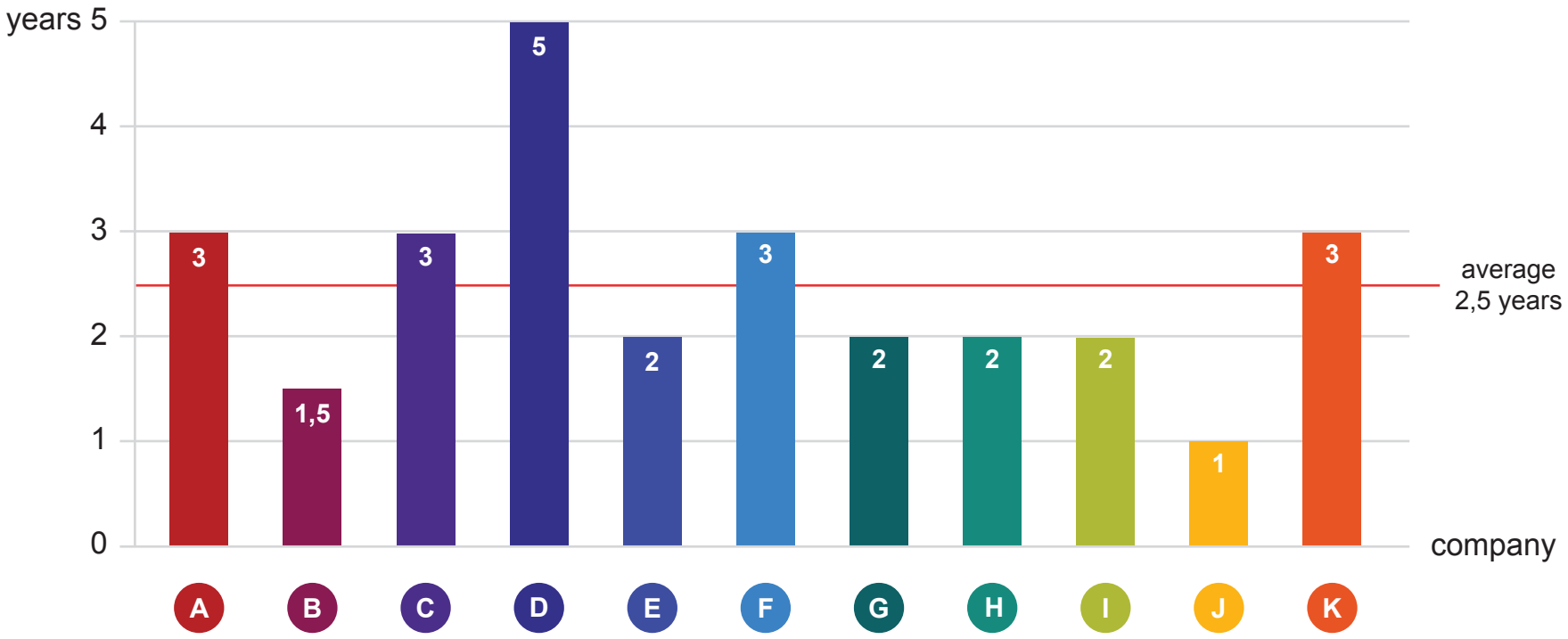
Long range warehouse capacity planning
DEFINITION

Planning horizon	■ Can range between 5 to 10 years
Unit of measurement	■ Pallet spaces

■ In **mid range** warehouse capacity planning the planning horizon considered is **up to 4 years.**

Forecast accuracy

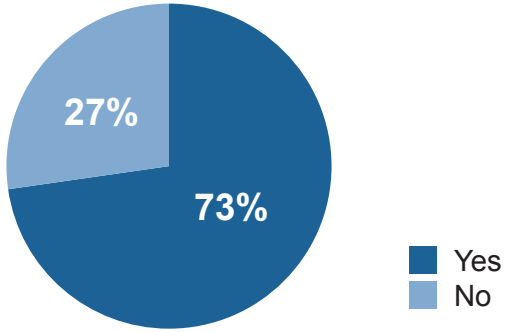
Time in which a warehouse capacity forecast is considered reliable



Global warehouse capacity planning

Availability of a central department for warehouse capacity planning

Do you have a central department for (rough) mid- to long-term warehouse capacity planning?



If not, who is responsible?	
	▪ Local sites ▪ No planning necessary because of flexible external contracts

Capacity planning processes

Overview of the main processes identified and different planning horizons

Central Location

Sales forecast planning			
Medium Term		**Long Term**	
not performed	18%	5 years	36%
1 year	27%	10 years	45%
2 years	9%		
3 years	18%		

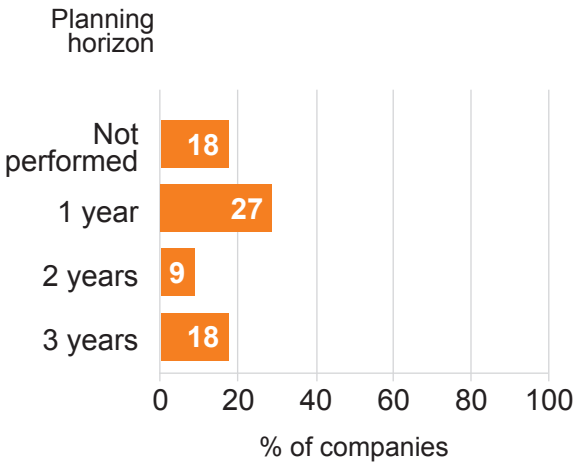
Production planning			
Medium Term		**Long Term**	
1 year	18%	5 years	36%
2 years	45%	10 years	45%
3 years	9%		
>3 years	9%		

Warehouse capacity planning			
Medium Term		**Long Term**	
not performed	9%	not performed	55%
1 year	36%	5 years	27%
2 years	36%		

Collection of sales forecasts

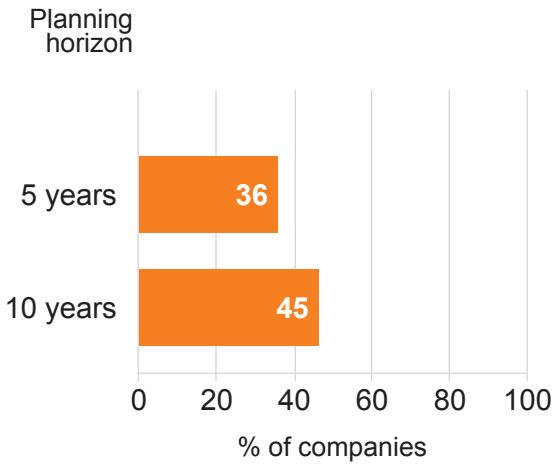
Inputs provided by sales departments to a central location

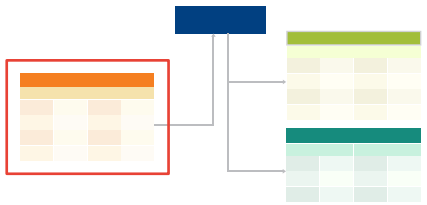
Medium term planning
(answers received: 8/11)



Sales forecast	
MAIN INPUTS PROVIDED	
Medium Term	**Long Term**
• Sales volumes per region/country	• Sales volumes per region/country
MAIN IT-SYSTEMS	
• SAP (APO) • Futurcast • Oracle • Share Point	
Mainly performed at a **LOCAL - REGIONAL** level	

Long term planning
(answers received: 9/11)

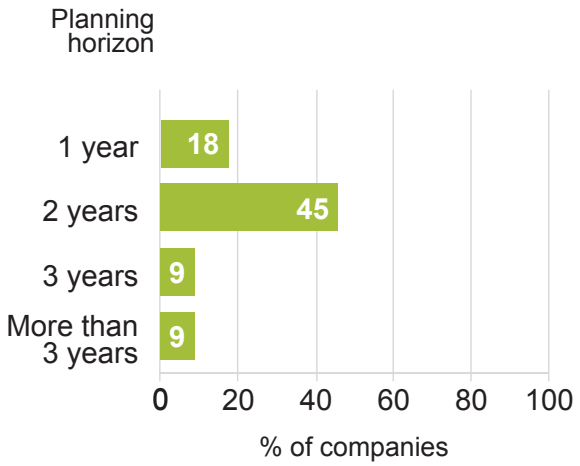




Production planning

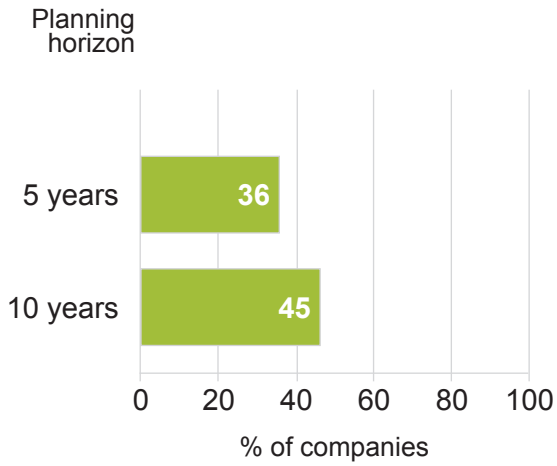
Planning horizon and IT-systems used for production planning

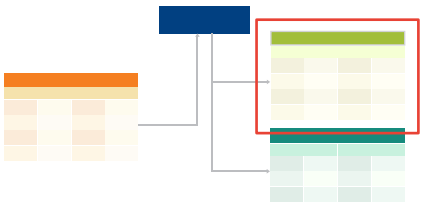
Medium term planning
(answers received: 9/11)



Production planning
PLANNING MAINLY BASED ON
• Hours
MAIN IT-SYSTEMS
• SAP (APO) • Kinaxis RapidResponse • Jonova • LLamasoft
Mainly performed at a **GLOBAL** level

Long term planning
(answers received: 9/11)

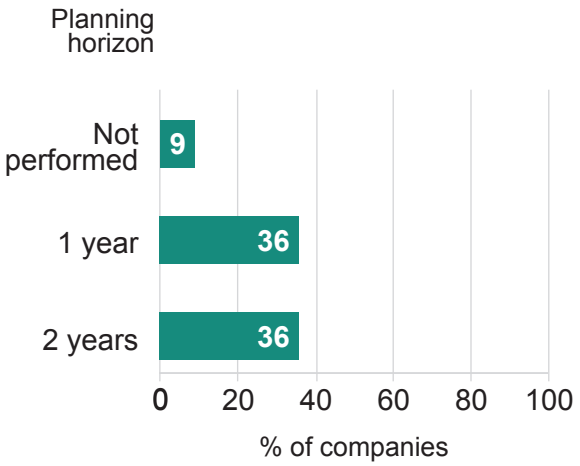




Warehouse capacity planning

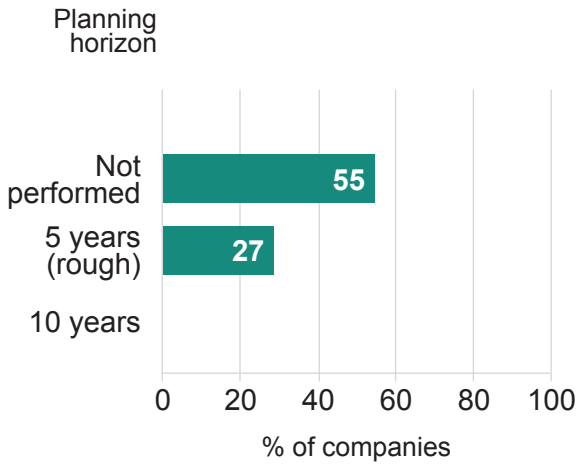
Planning horizon and IT-systems used for warehouse capacity planning

Medium term planning
(answers received: 9/11)

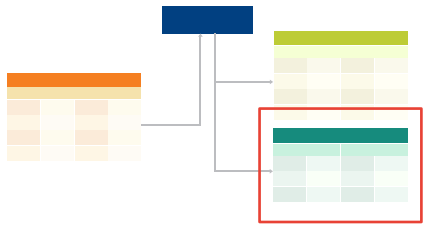


Warehouse planning
PLANNING MAINLY BASED ON
• Pallet spaces • Annual Volumes
MAIN IT-SYSTEMS
• Excel • SAP (APO,WM) • Proprietary systems • GT Nexus • JDA Planning • Share point
LOCALLY / GLOBALLY

Long term planning
(answers received: 9/11)



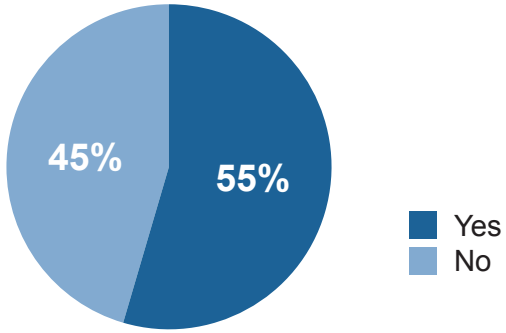
3 out of 11 companies perform a long-term warehouse capacity planning over a 5-year horizon. The rest of the companies is not performing a long-range planning.



IT infrastructure support in warehouse planning

Satisfaction with the IT systems currently in place

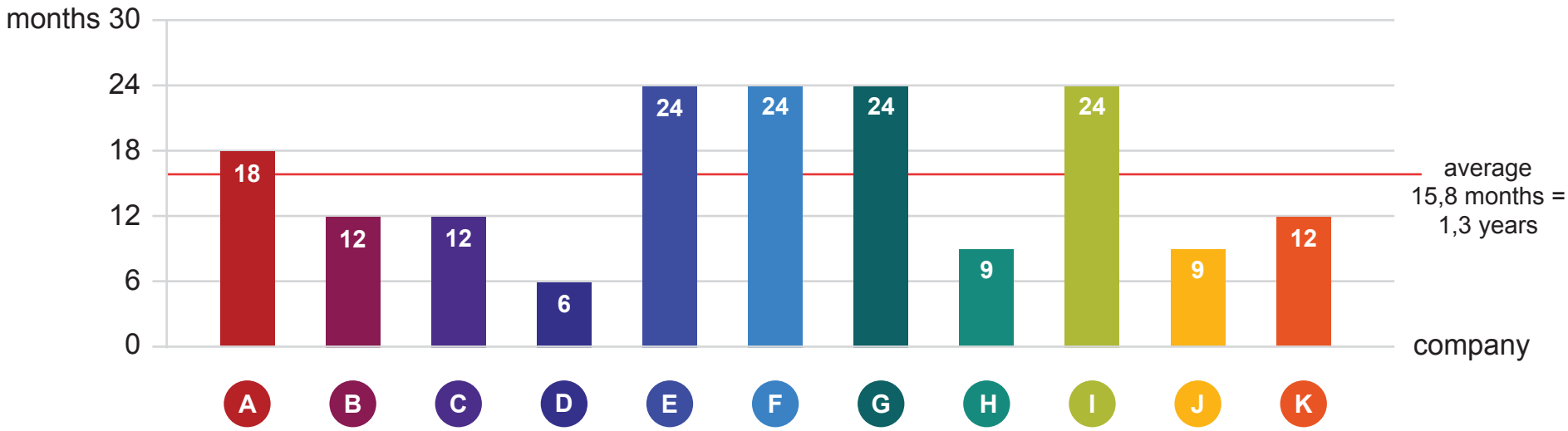
Does the IT-system support long-range warehouse capacity planning well?



YES, because	■ High integration ■ Completeness of data and information ■ High visibility
NO, because	■ Low integration ■ Low visibility ■ No long range warehouse capacity planning in place

Warehouse capacity increase

Time necessary to increase warehouse capacity



Most critical storages to increase capacity

- **Cold chain storages**
  (mentioned explicitly by 55% of the companies)

Besides the above estimation, other factors like the kind of storage, e.g. temperature zone or internal/external capacity, internal processes or authorities can strongly influence the time needed to increase capacities.

Conduction of interviews - study participants

Company	2012 Sales (US$Mio.)*	Place	Month
A	>10,000	CH	04’13
B	>10,000	DE	04’13
C	>10,000	DE	04’13
D	>10,000	CH	04’13
E	>10,000	DE	04’13
F	>10,000	CH	05’13
G	>10,000	CH	05’13
H	>10,000	Phone**	05’13
I	>10,000	BE	05’13
J	>10,000	Be	05’13
K	>10,000	Phone**	05’13

* IMS Health. (2012), “Top 20 global corporations 2012”, IMS Health, IMS MIDAS.’

** Due to time and cost constraints, a phone interview instead of face-to-face interview was conducted with 2 companies.

Conduction of interviews - study participants

- The results and conclusions of the study have been calculated and drawn based on the answers provided by the eleven pharmaceutical companies. Despite the representative selection of the companies, statistical relevance of the results will not be proven due to the small dimension of the sample; however, the results from and for pharmaceutical senior managers within the TOP20 companies should serve as a helpful and inspiring indicator.

- All companies are research-focused companies. Therefore, when mentioning the pharmaceutical industry this study only refers to research-focused companies. If a company differentiates between business units (animal health, generics branch, etc.) it is focused on the research-focused pharma branch whenever possible to ensure comparability of the results.

The authors would like to thank all participating organizations for offering their time and providing valuable insights in today's pharmaceutical supply chains.

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