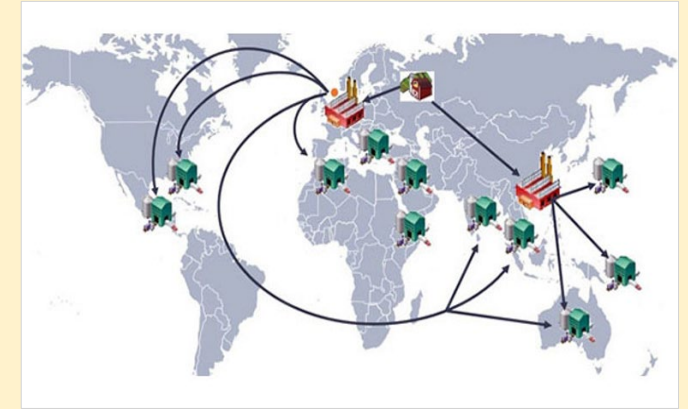
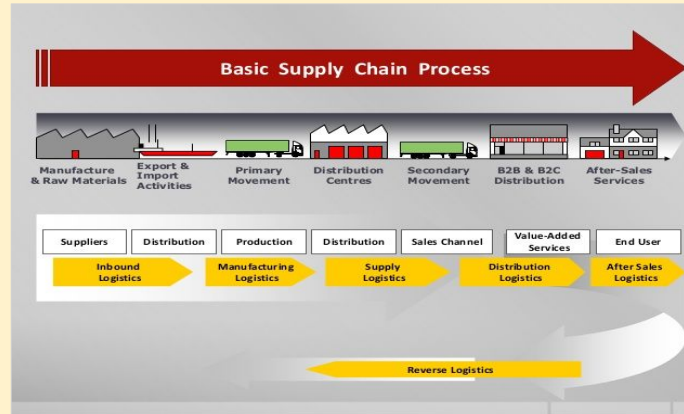
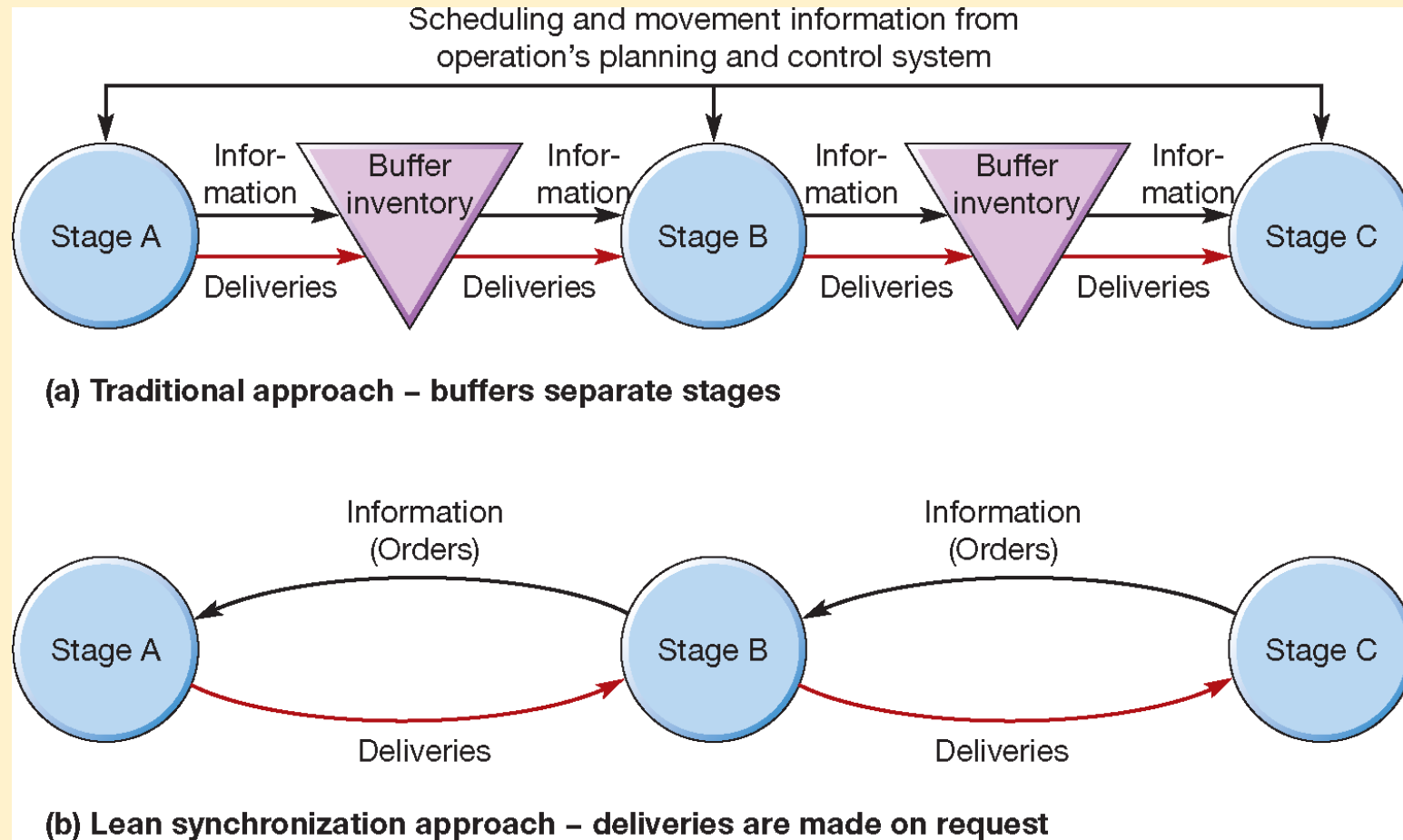


Lecture 7- Global Supply Chain



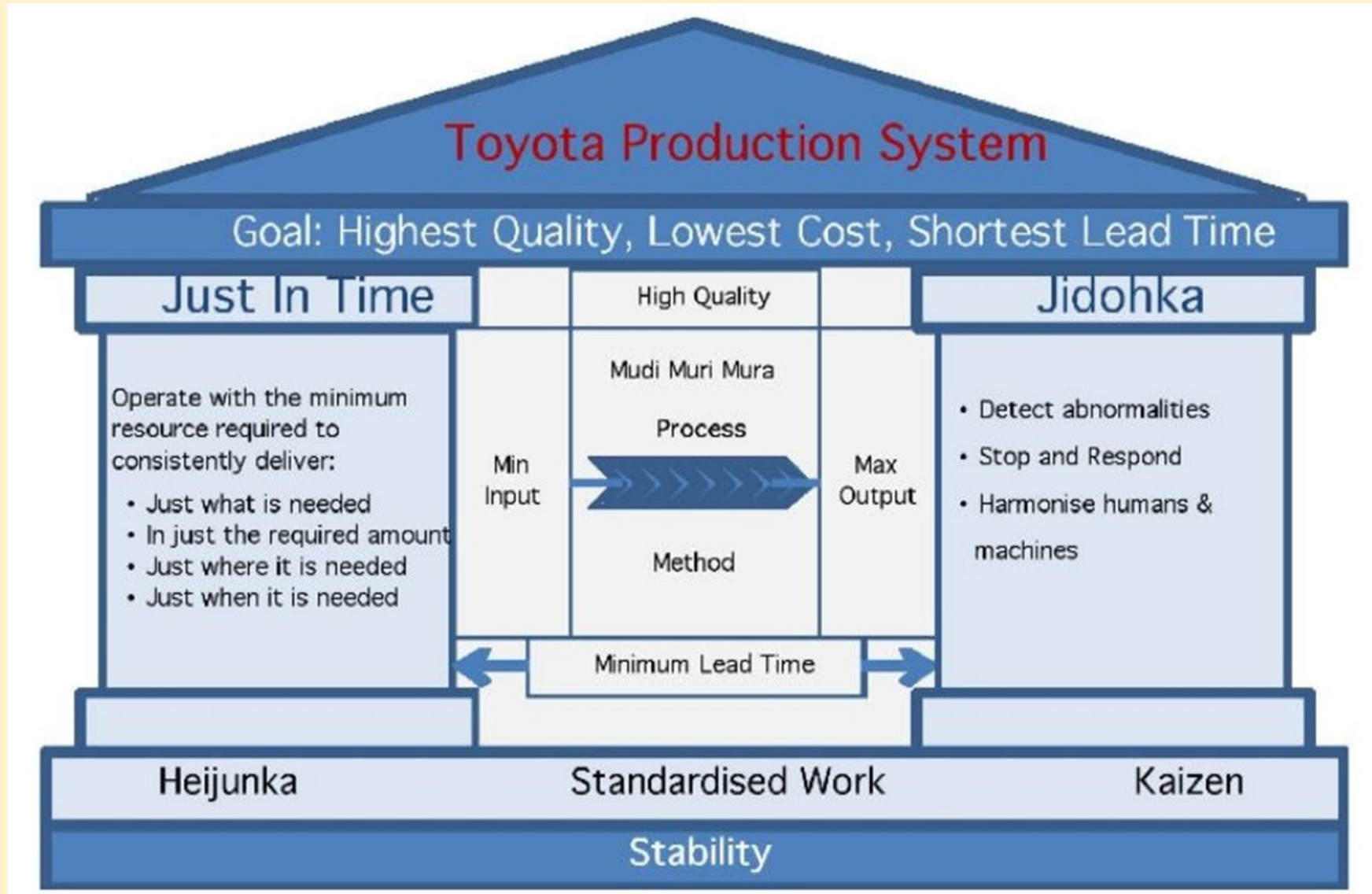
Recap

Traditional flow versus Lean flow between stages

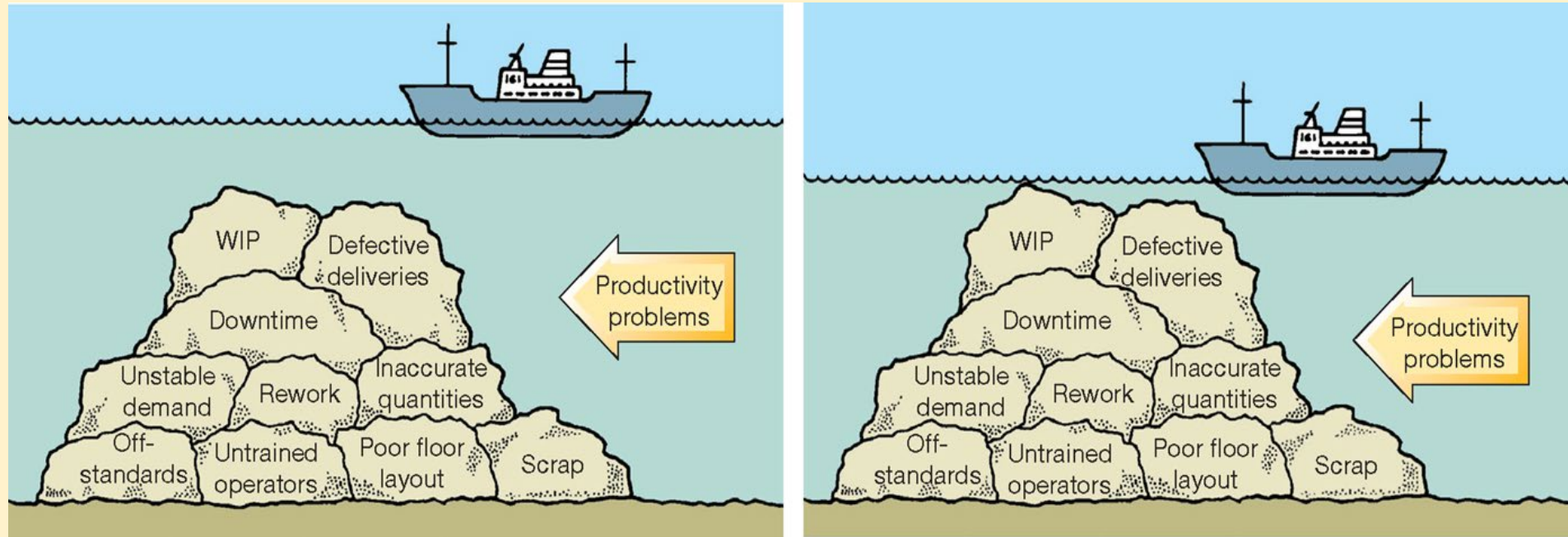


Slack et al (2015)

Toyota Production System

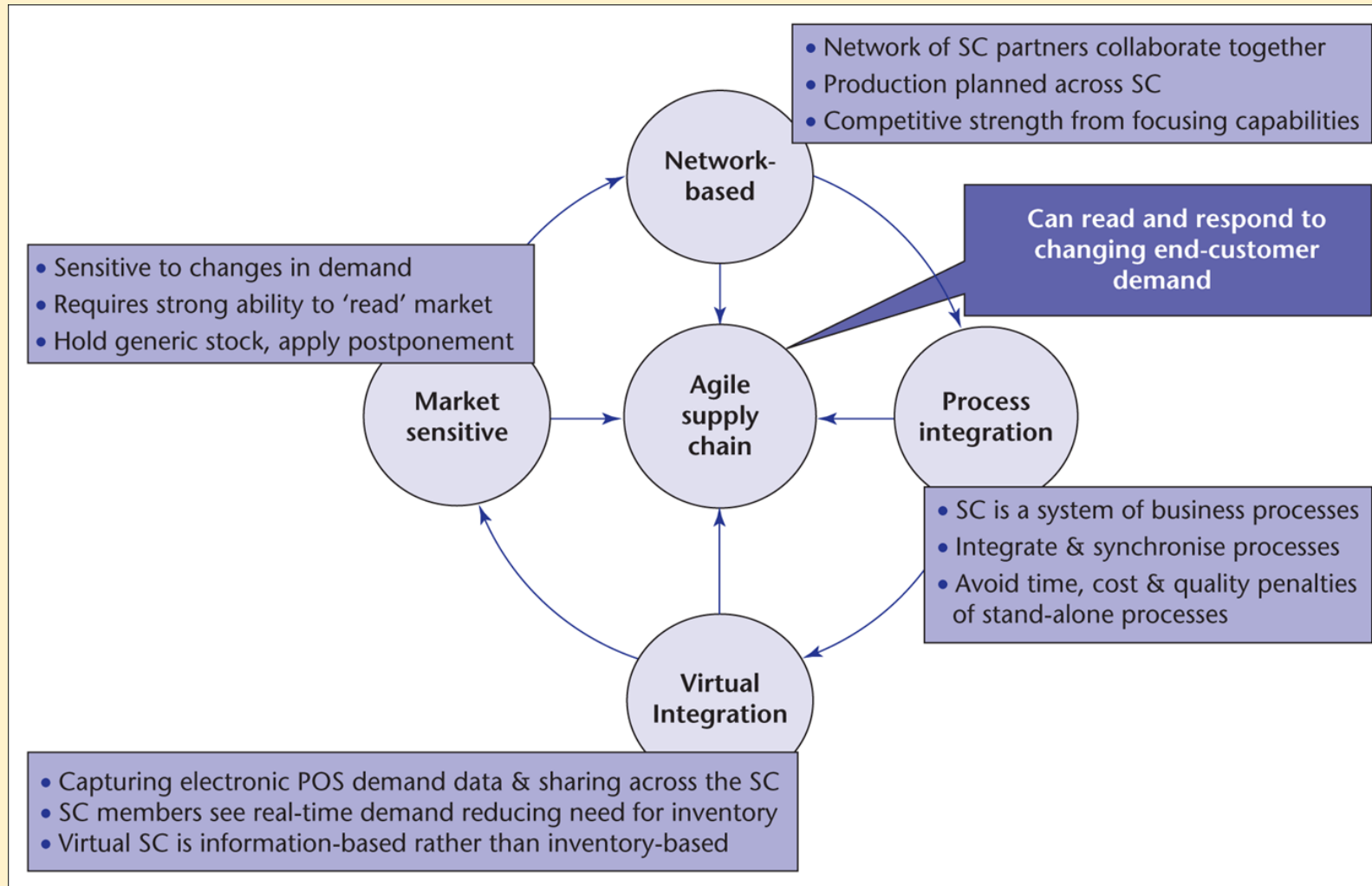


Reducing the level of inventory (water) allows operations management (the ship) to see the problems in the operation (the rocks) and work to reduce them

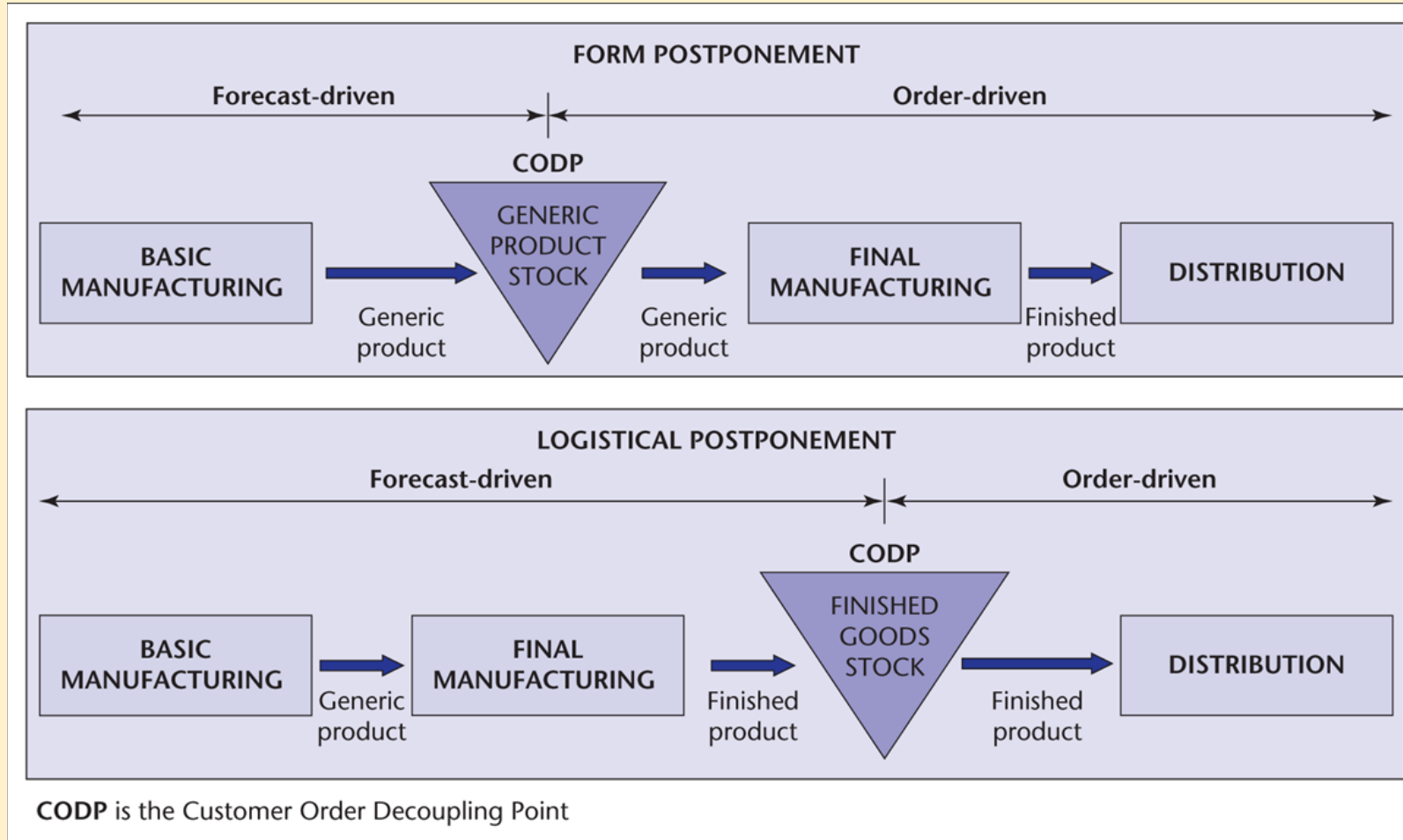


Slack et al (2015)

Model of Agile capabilities

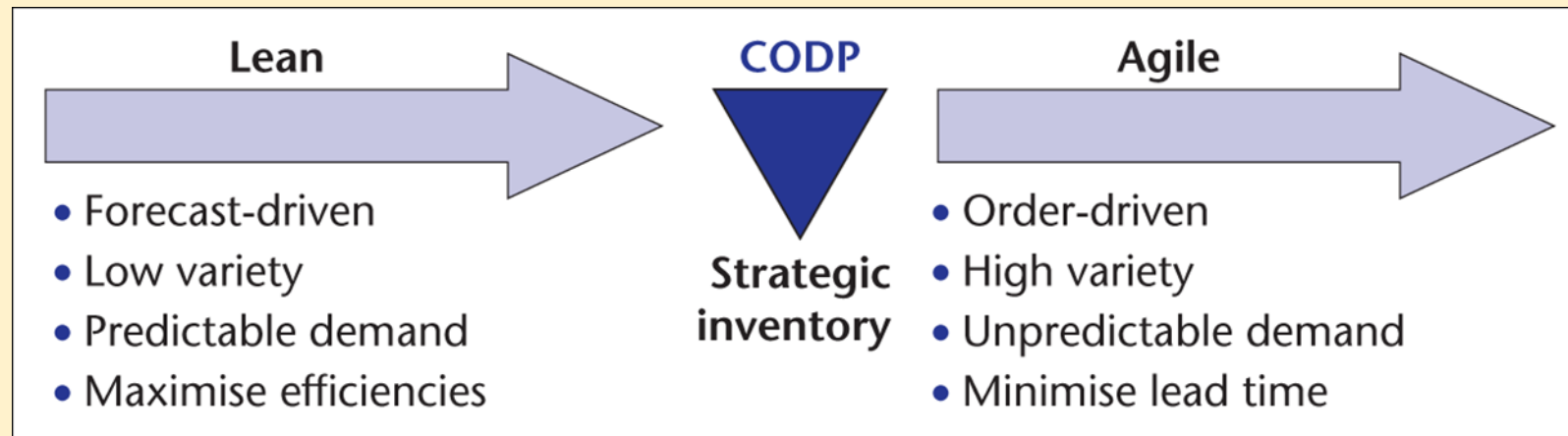


Form and Logistical Postponement



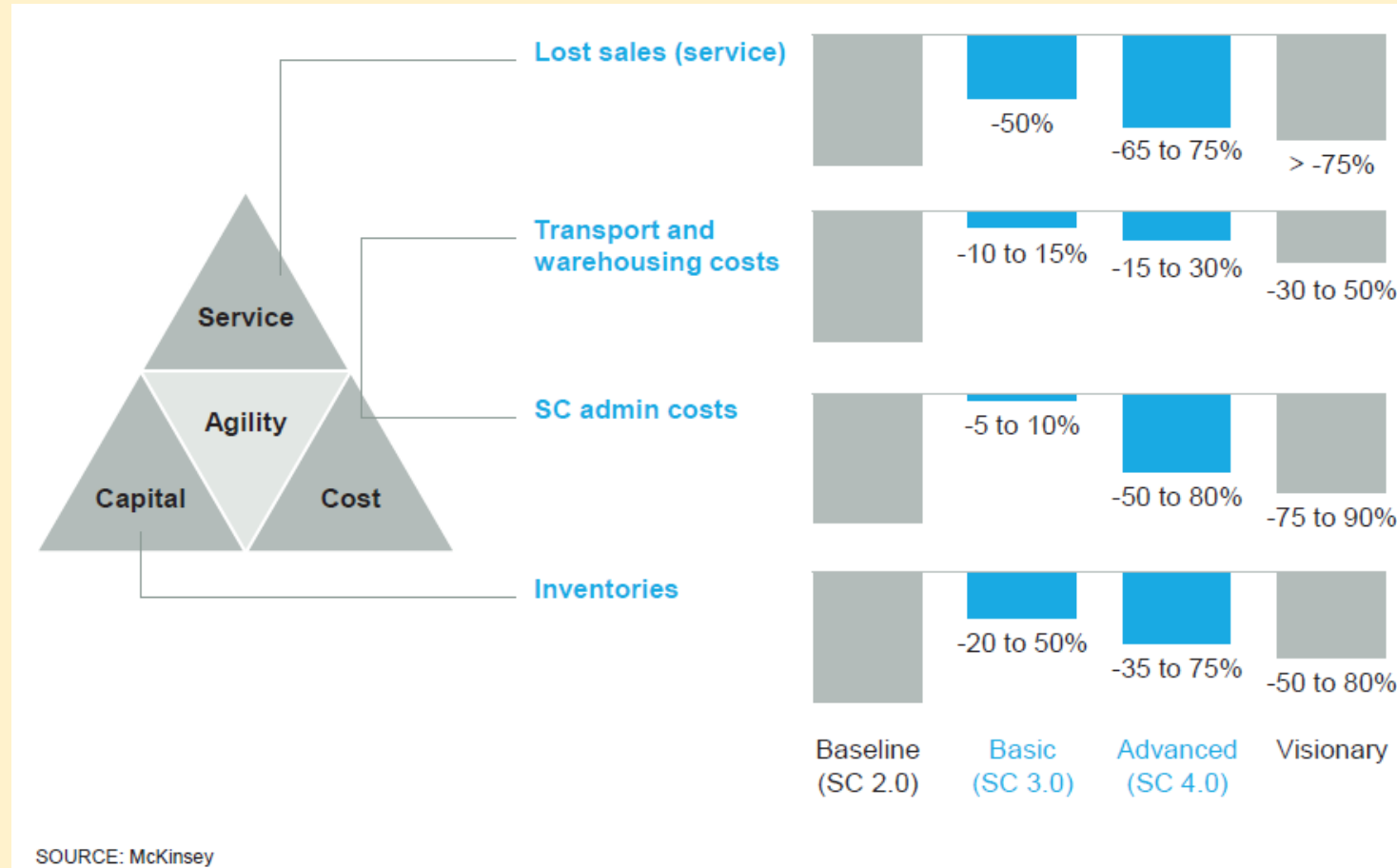
Harrison et al (2015)

Combination of lean and agile using a customer order decoupling point (CODP)



Harrison et al (2015)

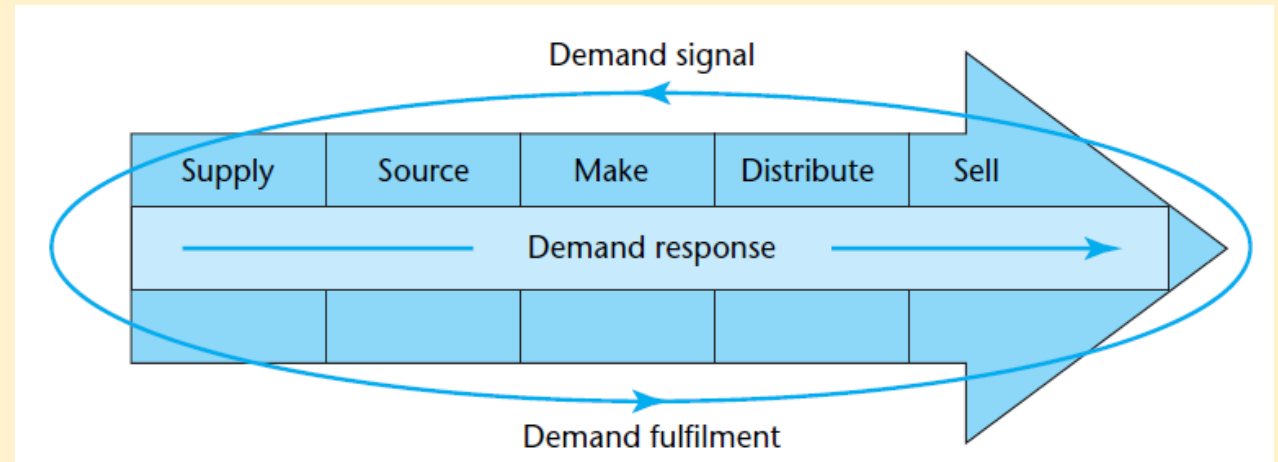
By applying Supply Chain 4.0 levers, huge potential can be unlocked



Back to Basics- Supply Chain Processes

Supply Chain Processes

- Supply
- Source
- Make
- Distribute
- Sell

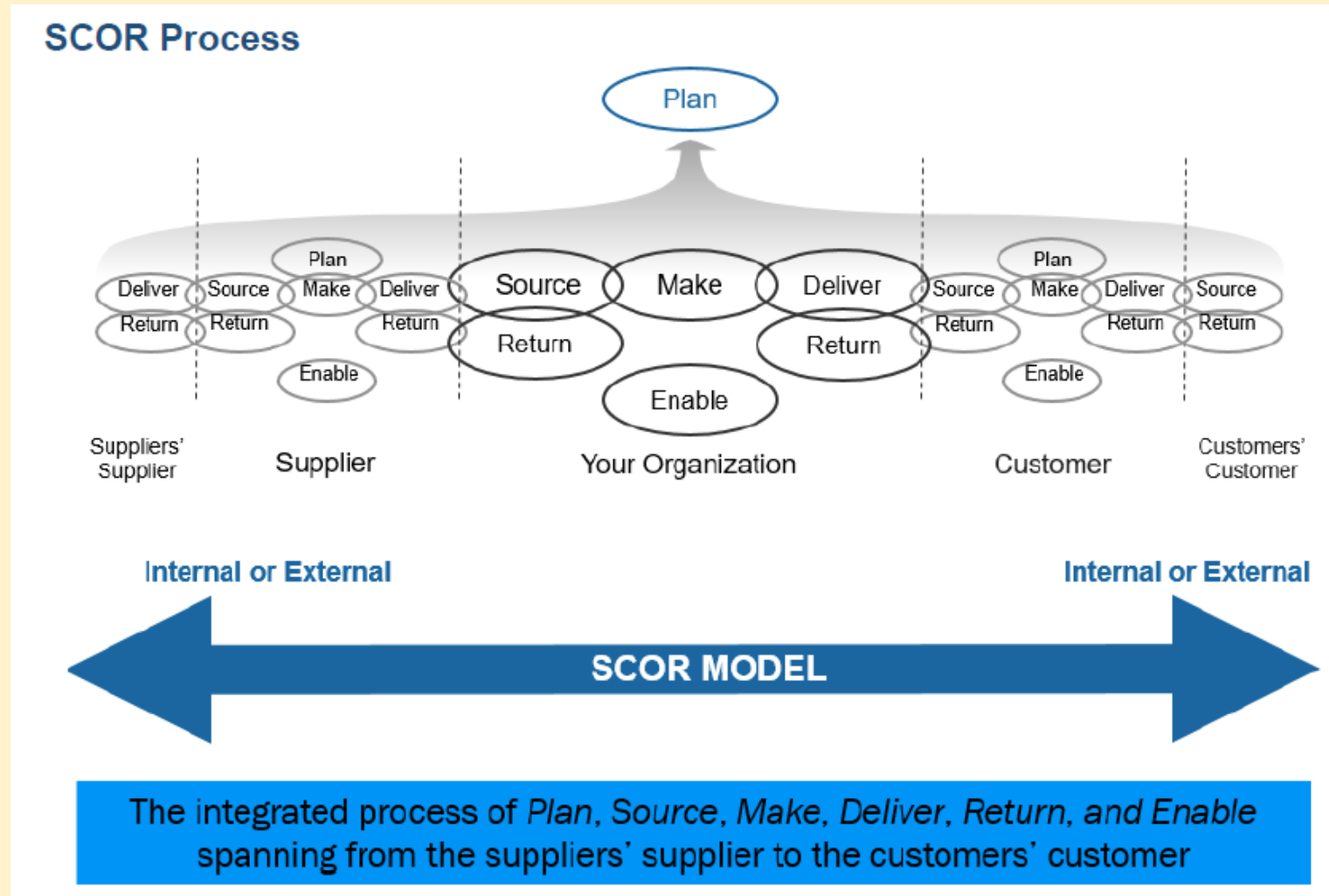


Harrison et al (2012)

Supplier	Firm	Customer
SRM	ISCM	CRM
<ul style="list-style-type: none"> • Source • Negotiate • Buy • Design Collaboration • Supply Collaboration 	<ul style="list-style-type: none"> • Strategic Planning • Demand Planning • Supply Planning • Fulfillment • Field Service 	<ul style="list-style-type: none"> • Market • Price • Sell • Call Center • Order Management

Chopra and Meindl (2013)

Supply Chain Operations Reference- SCOR 12.0 Model



Purpose of SCOR






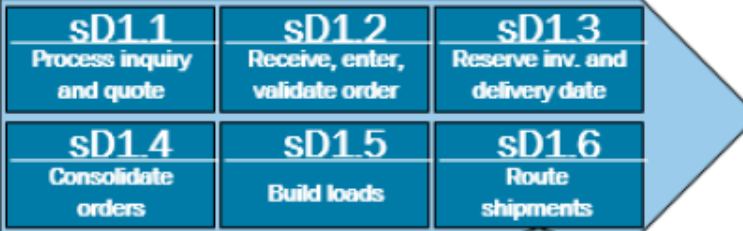

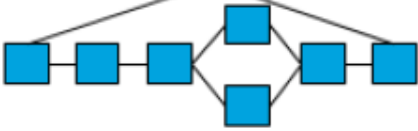
- **SCOR processes provide the building blocks**, the model that can be used to describe supply chains that are very simple or very complex
- It also provides a basis for the focal firm to **understand their supply chain performance and identify opportunities for improvements**

SCOR Management Processes

- The SCOR model has been developed to describe the **business activities associated with all phases of satisfying customer demand**
- Six primary management processes of:
 - Plan
 - Source
 - Make
 - Deliver
 - Return
 - Enable

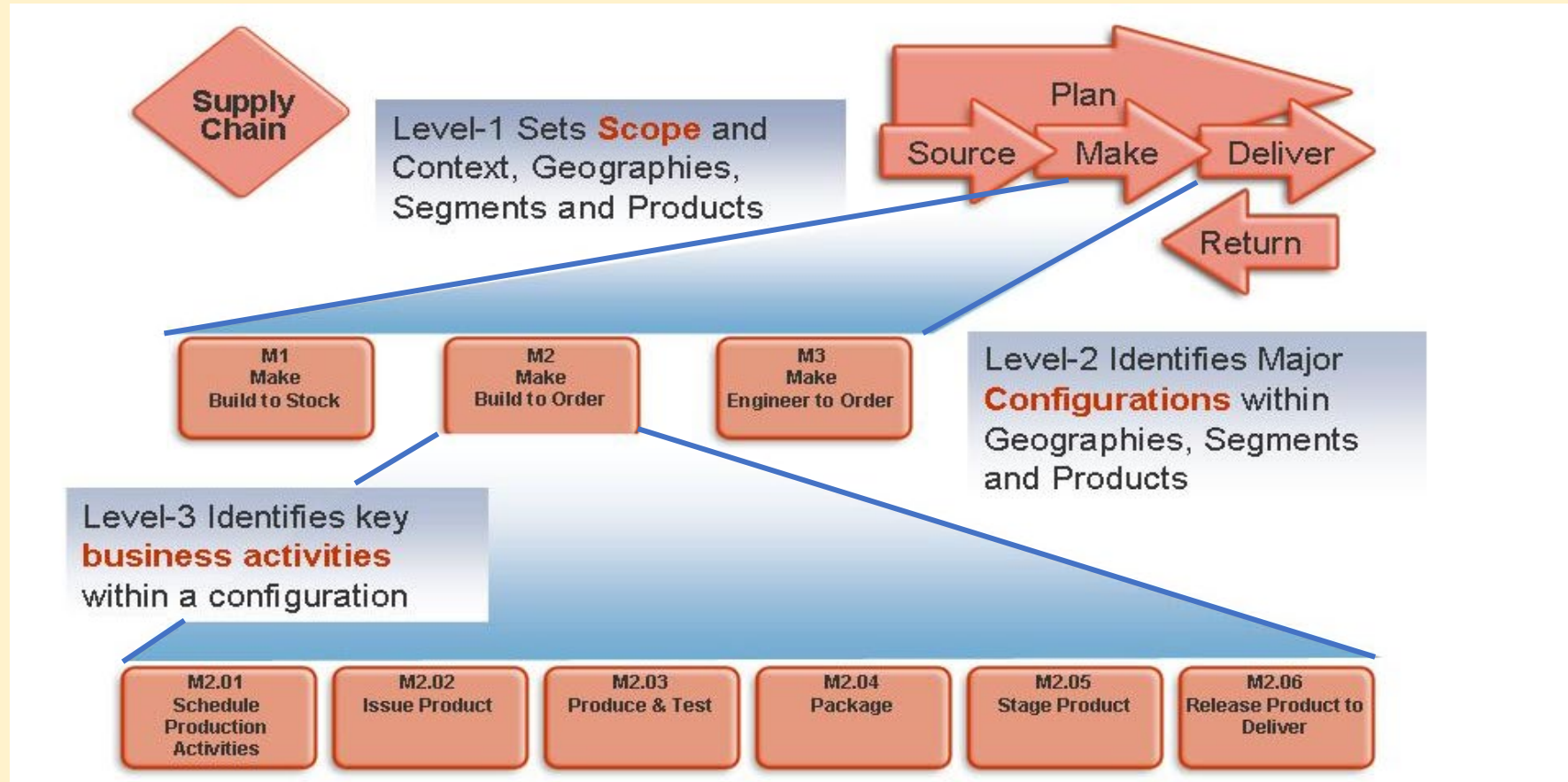
- **Plan:** planning demand and supply- long-term capacity and resource planning
- **Source:** material acquisition- vendor certification and vendor contracting
- **Make:** production execution- shop scheduling. Any added value activity e.g., material repackaging at a distribution centre; quality control
- **Deliver:** the day-to-day tasks of managing demand, orders, warehouse and transportation, and installation and commissioning.
- **Return:** the return of non-conforming goods for replacement or rectification, and the recycling of materials no longer needed by the customer
- **Enable:** include management of: business rules, performance, data, resources, facilities, contracts, supply chain network management, managing regulatory compliance and risk management.

SCOR Process Hierarchy

Level	Description	Schematic	Comments
 1	Major processes		Defines the scope, content, and performance targets of the supply chain
 2	Process categories		Defines the operations strategy; process capabilities are set
 3	Process elements		Defines the configuration of individual processes. The ability to execute is set. Focus is on processes, inputs/outputs, skills, performance, best practices, and capabilities
 4	Improvement tools/activities		Use of kaizen, lean, TQM, six sigma, benchmarking

APICS (2017)

Example of "Make-build to Order" scenario



SCOR Process Elements

sP - Plan					sS - Source			sM - Make			sD - Deliver			
sP1 Plan Supply Chain	sP2 Plan Source	sP3 Plan Make	sP4 Plan Deliver	sP5 Plan Return	sS1 Source Stocked Product	sS2 Source Make-to-Order Product	sS3 Source Engineer-to-Order Product	sM1 Make-to-Stock	sM2 Make-to-Order	sM3 Engineer-to-Order	sD1 Deliver Stocked Product	sD2 Deliver Make-to-Order Product	sD3 Deliver Engineer-to-Order Product	sD4 Deliver Retail Product
<p>sP1.1: Identify, Prioritize and Aggregate Supply Chain Requirements</p> <p>sP1.2: Identify, Prioritize and Aggregate Supply Chain Resources</p> <p>sP1.3: Balance Supply Chain Resources with SC Requirements</p> <p>sP1.4: Establish and Communicate Supply Chain Plans</p>	<p>sP2.1: Identify, Prioritize and Aggregate Product Requirements</p> <p>sP2.2: Identify, Assess and Aggregate Product Resources</p> <p>sP2.3: Balance Product Resources with Product Requirements</p> <p>sP2.4: Establish Sourcing Plans</p>	<p>sP3.1: Identify, Prioritize and Aggregate Production Requirements</p> <p>sP3.2: Identify, Assess and Aggregate Production Resources</p> <p>sP3.3: Balance Production Resources with Production Requirements</p> <p>sP3.4: Establish Production Plans</p>	<p>sP4.1: Identify, Prioritize and Aggregate Delivery Requirements</p> <p>sP4.2: Identify, Assess and Aggregate Delivery Resources</p> <p>sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements</p> <p>sP4.4: Establish Delivery Plans</p>	<p>sP5.1: Assess and Aggregate Return Requirements</p> <p>sP5.2: Identify, Assess and Aggregate Return Resources</p> <p>sP5.3: Balance Return Resources with Return Requirements</p> <p>sP5.4: Establish and Communicate Return Plans</p>	<p>sS1.1: Schedule Product Deliveries</p> <p>sS1.2: Receive Product</p> <p>sS1.3: Verify Product</p> <p>sS1.4: Transfer Product</p> <p>sS1.5: Authorize Supplier Payment</p>	<p>sS2.1: Schedule Product Deliveries</p> <p>sS2.2: Receive Product</p> <p>sS2.3: Verify Product</p> <p>sS2.4: Transfer Product</p> <p>sS2.5: Authorize Supplier Payment</p>	<p>sS3.1: Identify Sources of Supply</p> <p>sS3.2: Select Final Supplier and Negotiate</p> <p>sS3.3: Schedule Product Deliveries</p> <p>sS3.4: Receive Product</p> <p>sS3.5: Verify Product</p> <p>sS3.6: Transfer Product</p> <p>sS3.7: Authorize Supplier Payment</p>	<p>sM1.1: Schedule Production Activities</p> <p>sM1.2: Issue Material</p> <p>sM1.3: Produce and Test</p> <p>sM1.4: Package</p> <p>sM1.5: Stage Product</p> <p>sM1.6: Release Product to Deliver</p> <p>sM1.7: Waste Disposal</p>	<p>sM2.1: Schedule Production Activities</p> <p>sM2.2: Issue Sourced/In-Process Product</p> <p>sM2.3: Produce and Test</p> <p>sM2.4: Package</p> <p>sM2.5: Stage Finished Product</p> <p>sM2.6: Release Finished Product to Deliver</p> <p>sM2.7: Waste Disposal</p>	<p>sM3.1: Finalize Production Engineering</p> <p>sM3.2: Schedule Production Activities</p> <p>sM3.3: Issue Sourced/In-Process Product</p> <p>sM3.4: Produce and Test</p> <p>sM3.5: Package</p> <p>sM3.6: Stage Finished Product</p> <p>sM3.7: Release Product to Deliver</p> <p>sM3.8: Waste Disposal</p>	<p>sD1.1: Process Inquiry and Quote</p> <p>sD1.2: Receive, Enter, and Validate Order</p> <p>sD1.3: Reserve Inventory and Determine Delivery Date</p> <p>sD1.4: Consolidate Orders</p> <p>sD1.5: Build Loads</p> <p>sD1.6: Route Shipments</p> <p>sD1.7: Select Carriers and Rate Shipments</p> <p>sD1.8: Receive Product from Source or Make</p> <p>sD1.9: Pick Product</p> <p>sD1.10: Pack Product</p> <p>sD1.11: Load Vehicle & Generate Shipping Docs</p> <p>sD1.12: Ship Product</p> <p>sD1.13: Receive and Verify Product by Customer</p> <p>sD1.14: Install Product</p> <p>sD1.15: Invoice</p>	<p>sD2.1: Process Inquiry and Quote</p> <p>sD2.2: Receive, Configure, Enter and Validate Order</p> <p>sD2.3: Reserve Inventory and Determine Delivery Date</p> <p>sD2.4: Consolidate Orders</p> <p>sD2.5: Build Loads</p> <p>sD2.6: Route Shipments</p> <p>sD2.7: Select Carriers and Rate Shipments</p> <p>sD2.8: Receive Product from Source or Make</p> <p>sD2.9: Pick Product</p> <p>sD2.10: Pack Product</p> <p>sD2.11: Load Product & Generate Shipping Docs</p> <p>sD2.12: Ship Product</p> <p>sD2.13: Receive and Verify Product by Customer</p> <p>sD2.14: Install Product</p> <p>sD2.15: Invoice</p>	<p>sD3.1: Obtain and Respond to RFP/ RFQ</p> <p>sD3.2: Negotiate and Receive Contract</p> <p>sD3.3: Enter Order, Commit Resources & Launch Program</p> <p>sD3.4: Schedule Installation</p> <p>sD3.5: Build Loads</p> <p>sD3.6: Route Shipments</p> <p>sD3.7: Select Carriers & Rate Shipments</p> <p>sD3.8: Receive Product from Source or Make</p> <p>sD3.9: Pick Product</p> <p>sD3.10: Pack Product</p> <p>sD3.11: Load Product & Generate Shipping Docs</p> <p>sD3.12: Ship Product</p> <p>sD3.13: Receive and Verify Product by Customer</p> <p>sD3.14: Install Product</p> <p>sD3.15: Invoice</p>	<p>sD4.1: Generate Stocking Schedule</p> <p>sD4.2: Receive Product at Store</p> <p>sD4.3: Pick Product from backroom</p> <p>sD4.4: Stock Shelf</p> <p>sD4.5: Fill Shopping Cart</p> <p>sD4.6: Checkout</p> <p>sD4.7: Deliver and/or install</p>

sR - Return						sE - Enable								
sSR1 Source Return Defective Product	sSR2 Source Return MRO Product	sSR3 Source Return Excess Product	sDR1 Deliver Return Defective Product	sDR2 Deliver Return MRO Product	sDR3 Deliver Return Excess Product	sE1 Manage Supply Chain Business Rules	sE2 Manage Supply Chain Performance	sE3 Manage Supply Chain Data and Information	sE4 Manage Supply Chain Human Resources	sE5 Manage Supply Chain Assets	sE6 Manage Supply Chain Contracts	sE7 Manage Supply Chain Network	sE8 Manage Supply Chain Regulatory Compliance	sE9 Manage Supply Chain Risk
sSR1.1: Identify Defective Product Condition sSR1.2: Disposition Defective Product sSR1.3: Request Defective Product Return Authorization sSR1.4: Schedule Defective Product Shipment sSR1.5: Return Defective Product	sSR2.1: Identify MRO Product Condition sSR2.2: Disposition MRO Product sSR2.3: Request MRO Return Authorization sSR2.4: Schedule MRO Shipment sSR2.5: Return MRO Product	sSR3.1: Identify Excess Product Condition sSR3.2: Disposition Excess Product sSR3.3: Request Excess Product Return Authorization sSR3.4: Schedule Excess Product Shipment sSR3.5: Return Excess Product	sDR1.1: Authorize Defective Product Return sDR1.2: Schedule Defective Return Receipt sDR1.3: Receive Defective Product (includes verify) sDR1.4: Transfer Defective Product	sDR2.1: Authorize MRO Product Return sDR2.2: Schedule MRO Return Receipt sDR2.3: Receive MRO Product sDR2.4: Transfer MRO Product	sDR3.1: Authorize Excess Product Return sDR3.2: Schedule Excess Return Receipt sDR3.3: Receive Excess Product sDR3.4: Transfer Excess Product	sE1.1: Gather Business Rule Requirements sE1.2: Interpret Business Rule Requirement sE1.3: Document Business Rule sE1.4: Communicate Business Rule sE1.5: Release/Publish Business Rule sE1.6: Retire Business Rule	sE2.1: Initiate Reporting sE2.2: Analyze Reports sE2.3: Find Root Causes sE2.4: Prioritize Root Causes sE2.5: Develop Corrective Actions sE2.6: Approve & Launch	sE3.1: Receive Maintenance Request sE3.2: Determine/Scope Work sE3.3: Maintain Content/Code sE3.4: Maintain Access sE3.5: Publish Information sE3.6: Verify Information	sE4.1: Identify Skills/ Resource Requirement sE4.2: Identify Available Skills/Resources sE4.3: Match Skills/ Resources sE4.4: Determine Hiring/ Redeployment sE4.5: Determine Training/Education sE4.6: Approve, Prioritize and Launch	sE5.1: Schedule Asset Management Activities sE5.2: Take Asset Off-line sE5.3: Inspect and Troubleshoot sE5.4: Install and Configure sE5.5: Clean, Maintain and Repair sE5.6: Decommission and Dispose sE5.7: Inspect Maintenance sE5.8: Reinstate Asset	sE6.1: Receive Contract/ Contract Updates sE6.2: Enter and Distribute Contract sE6.3: Activate/Archive Contract sE6.4: Review Contractual Performance sE6.5: Identify Performance Issues/ Opportunities sE6.6: Identify Resolutions/ Improvements sE6.7: Select, Prioritize and Distribute Resolutions	sE7.1: Select Scope and Organization sE7.2: Gather Input and Data sE7.3: Develop Scenarios sE7.4: Model/Simulate Scenarios sE7.5: Project Impact sE7.6: Select and Approve sE7.7: Develop Change Program sE7.8: Launch Change Program	sE8.1: Monitor Regulatory Entities sE8.2: Assess Regulatory Publications sE8.3: Identify Regulatory Deficiencies sE8.4: Define Remediation sE8.5: Verify/Obtain License sE8.6: Publish Remediation	sE9.1: Establish Context sE9.2: Identify Risk Events sE9.3: Quantify Risks sE9.4: Evaluate Risks sE9.5: Mitigate Risk

SCOR Performance Attributes

- **Customer-focused-**

- Reliability,
- Responsiveness
- Agility

- **Internal-focused-**

- Cost
- Asset Management Efficiency



Global Supply Chain

The Firm cannot become 'world class' by itself!

What does it mean?- Internationalization

- International sourcing of component parts
- International markets for finished goods
- Worldwide marketing of products under a common brand

FROM:

- localized focus, manufacturing and marketing its products in individual countries

TO:

- Source its materials and components in more than one country
- Global production and distribution
- multiple assembly or manufacturing locations geographically dispersed

Apple International Suppliers

Location and number of Apple suppliers per country



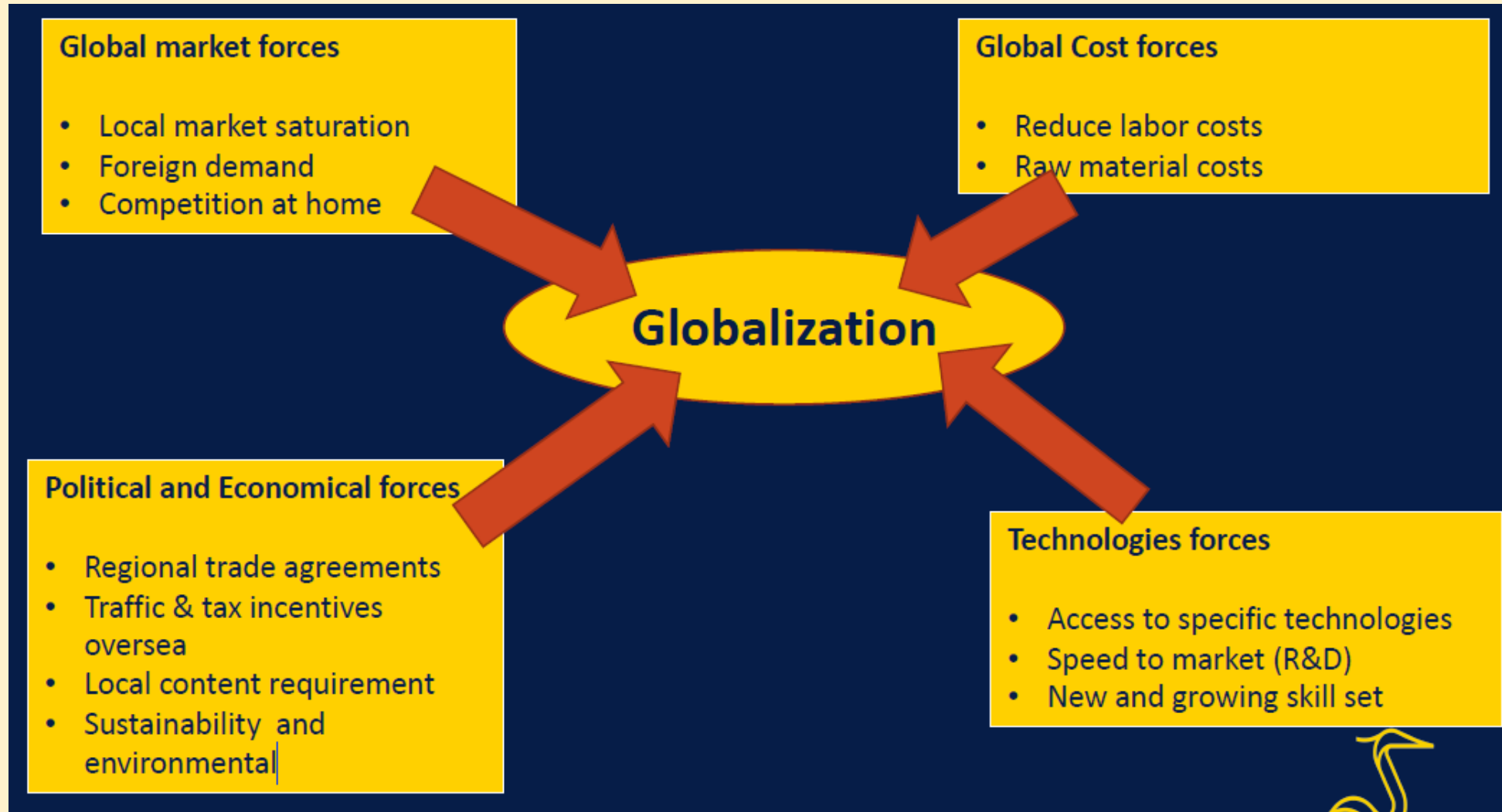
Apple iPhone Global Supply Chain | CNBC



<https://www.youtube.com/watch?v=Cw3V2x5u54Y>



Why companies go global?

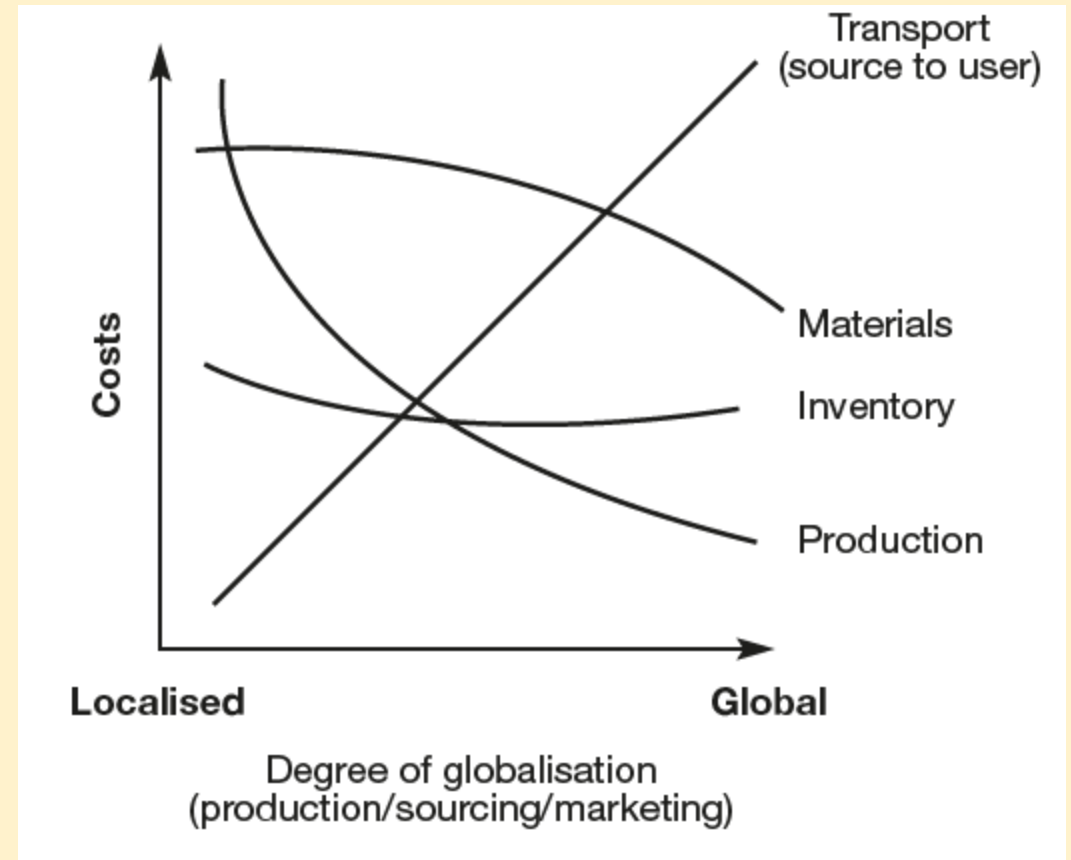


Generic drivers of internationalisation

- a search for low factor and supply costs (land, labour, materials)
- the need to follow customers internationally in order to be able to supply locally and fast
- a search for new geographical market areas
- a search for new learning opportunities and exposure to knowledge

Main Drivers of Internationalization

- Globalization offers companies opportunities to simultaneously **grow revenues** and **decrease costs**



Christopher (2013) Trade-offs in global logistics

Apple's Cost reduction

\$4

Extra cost if iPhones are assembled in the U.S. Apple's manufacturing strategy is motivated by scalability and supply chain risk rather than cost

\$600 Million

Additional labor cost for reshoring iPhone production in the US

35%

Tax on profits Apple would have to pay for US-made iPhones versus 2% on overseas profits

"If Apple brought iPhone manufacturing to the US it would cost them **\$4.2 Billion**"

- Tim Worstall, FORBES



US lacks labor capacity to ramp up production

Period to hire
8,700 engineers
to manage
200,000
factory workers



USA
9 months



CHINA
15 days

Main Risks

- Global supply chains are made **more complicated** by uncertainty and **difficulty of control**
- **Uncertainty arises** from longer lead times and lack of knowledge over risks and local market conditions
- **World markets are not homogeneous**, there is still a requirement for local variation in many product categories

'Supply chain challenges' hit revenues at Nike



posted by *Will Green*
in *Risk, Supply chain*

🕒 19 March 2021

Nike has said port congestion delayed inventory supply and held back the company's growth in North America.

The company said revenue dropped 10% in North America in the three months to 28 February 2021 due to “supply chain challenges”, which included global container shortages and US port congestion.

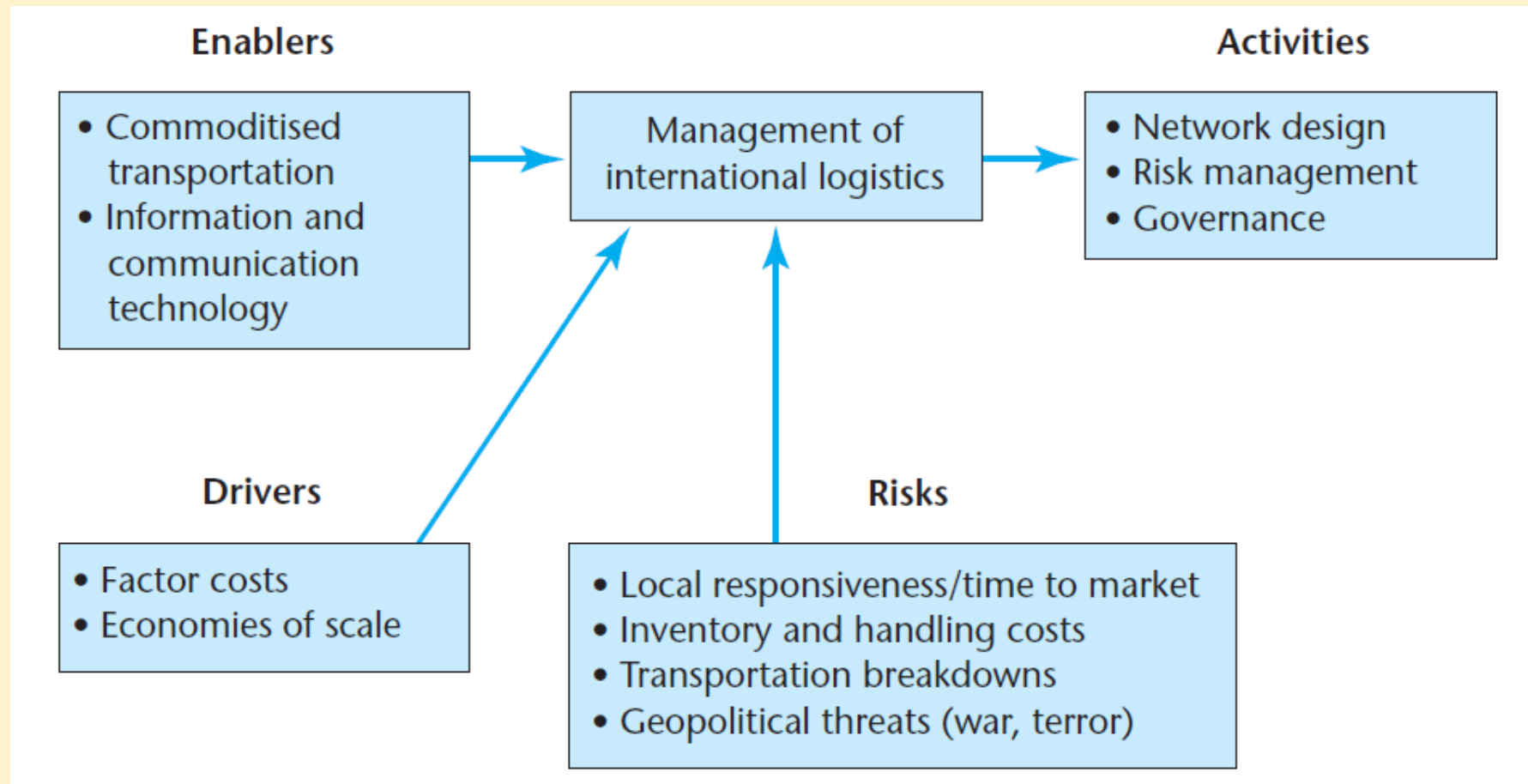
In an earnings call Matt Friend, executive vice president and CFO, said: “Disruption in the global supply chain due to container shortages, transportation delays, and port congestion has interrupted the flow of inventory supply.

“The result has been supply shortages relative to continued strong marketplace demand.

“In North America specifically, inventory supply was delayed by more than three weeks, impacting the timing of wholesale shipments and growth in the quarter.”

Nike said inventories were up 15% year-on-year to \$6.7bn, largely because of “higher in-transit inventory in North America due to US port congestion and temporary store closures in EMEA”.

Decision framework for international logistics



Business Approach is not a Universal patterns

- Does internationalization imply a universal global approach of the supply chain?
- Does internationalization require a 'global' presence in every market?
 - 'McColonisation' and 'CocaColonisation'- abolished.
 - Move away from universal product, marketing, and production and distribution model
 - Procter & Gamble is doing the same
 - Unilever, however has decrease the number of brands, and has rationalized operations away from strict localization
 - **Regional variations in the application of international principles.**

Logistics implications of internationalisation

Logistics implications of internationalisation

- Inventory
- Handling
- Transport
- Product obsolescence

Inventory

- **Centralising inventories** across multiple countries can hold advantages in terms of inventory-holding costs and inventory levels that are especially relevant for high-value products.
- On the other hand, internationalisation **may lead to product proliferation** due to the need for localisation of products and the need to respond to specific local product/market opportunities

Inventory-holding costs

- **Lead time spent in the logistics pipeline increases the holding cost of inventory.**
- In addition to the **time spent in physical transit**, goods travelling internationally will incur other delays.
- These **occur at consolidation points** in the process, such as in warehouses where goods are stored until they can be consolidated into a full load, such as a container.
- **Delay frequently occurs at the point of entry into a country while customs and excise procedures are followed.**

Handling

- Logistics service practices may differ across countries as well as regulation on storage and transport.
- Adjusting handling practices accordingly is a prerequisite for internationalisation.
- Furthermore, the opportunity to implement best practice across various facilities may also be possible

Transport

- logistics pipelines are extended and have to cope with differences in infrastructure across countries
- This may drive localisation
- However, opportunity for global consolidation may drive international centralization
- Consider trade-off between the benefits of being able to consolidate operations globally on the one hand, and the need to compete in a timely manner

Product obsolescence

- The extended lead time inherent in international logistics pipelines means that products run the risk of becoming obsolete during their time in transit
- products in industries with rapid technological development:
 - personal computing and consumer electronics
 - fashion goods such as clothing and footwear

Implementing Global Logistics Strategies

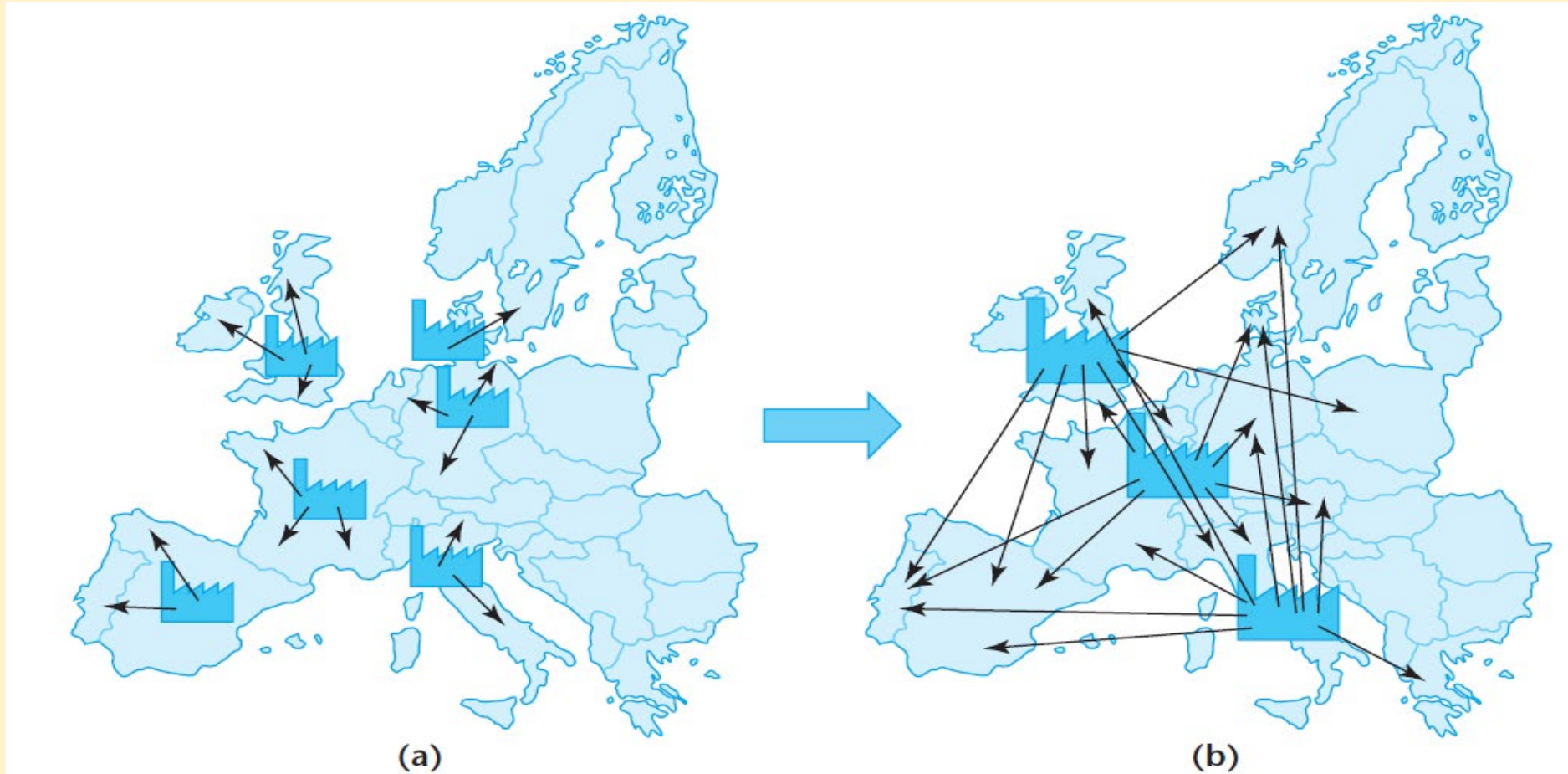
Global Logistics Strategies

- Focused Factories
- Centralized Inventory
- Postponement
- Location
- Layering and Tiering

Focused Factories

- Involves a company's consolidating production of products in specific factories.
- Each 'focused factory' supplies its products internationally to a wide market
- Focuses on a limited segment of the product assortment.
- **So, instead of "local-for-local" production, each location produces a few items world wide**
- **Rationalise production into fewer locations**

Focused factories: from geographical to product segmentation



(a) Focused markets: full-range manufacture for local markets

(b) Focused factories: limited range manufacturing for all markets

Harrison et al (2012)

Focused Factories Example

- **Kellogs** who manufacture their successful product Pringles in just two plants to meet worldwide demand
- **M&Ms** for sale in Moscow are likely to have been produced in the United States
- **Heinz** produce tomato ketchup for all of Europe from just three plants
- **Unilever's** long-established soap brand, Pears, is produced in India for world markets

Obvious trade-offs

- The effect on transport costs and delivery lead-times
- The costs of shipping products, often of relatively low value, across greater distances may erode some or all of the production cost saving
- The longer lead-times involved may need to be countered by local stock holding, again possibly offsetting the production cost advantage

Problems of focused production

1. The **need for local packs** exist, e.g. with labelling in different languages or even different brand names and packages

- **Overcome by 'postponing'** the final packaging until closer to the point-of-sale

2. **Customers ordering a variety of products** from the same company on a single order but which are now produced in a number of focused factories in different locations

- **Solution** here may be some type of trans-shipment or cross-dock operation where flows of goods from diverse localities and origins are merged for onward delivery to the customer

Rethinking Focused Factories

- **Sony** used to manufacture their digital cameras and camcorders in China, attracted by the lower labour costs
- Less than 10 per cent of a high-tech company's costs are direct labour.
- In addition, because life cycles were so short for these products it was better to bring the assembly back to Japan where the product design took place and, indeed, where most of the components originated
- Hence the **decision to source offshore**, simply to save on labour costs, makes little sense if penalties are incurred elsewhere in the supply chain

The Offshoring Decision: TOTAL COST

- Adam Smith in *The Wealth of Nations* when he stated,
“If a foreign country can supply us with commodity cheaper than we ourselves can make it, better buy it of them with some part of the produce of our own industry, employed in a way in which we have some advantage.”
- **Cost reduction by moving production to low-cost countries** is typically mentioned among the top reasons for a supply chain to become global
- BUT it is not automatic.

Economy / China Economy

Coronavirus: shipping rates to stay at 'unprecedented' levels until pandemic brought under control

- The coronavirus pandemic has driven shipping costs to record levels, with trade disruptions throwing global container flows into disarray
- Despite efforts to boost container production in China, some experts estimate shortages and port congestion could stretch on until early 2022



Cissy Zhou

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Published: 4:00pm, 3 Jun, 2021 ▾

 Why you can trust SCMP

- Companies have failed to gain from offshoring for two primary reasons:
 1. focusing exclusively on unit cost **rather than total cost** when making the offshoring decision
 2. ignoring critical risk factors.

Key elements of total cost- Offshoring

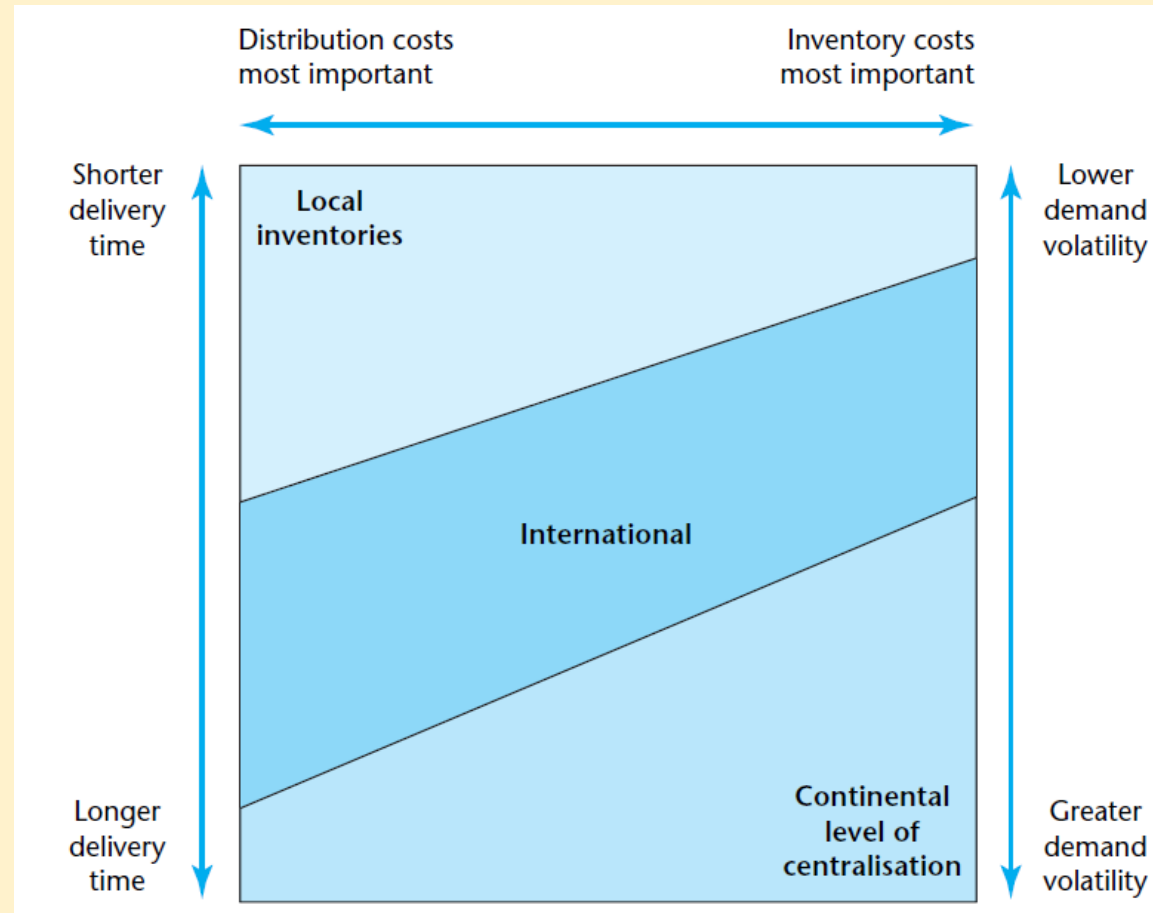
1. **Supplier price:** should link to costs from direct materials, direct labor, indirect labor, management, overhead, capital amortization, local taxes, manufacturing costs, and local regulatory compliance costs.
2. **Terms:** costs are affected by net payment terms and any volume discounts.
3. **Delivery costs:** include in-country transportation, ocean/air freight, destination transport, and packaging.
4. **Inventory and warehousing:** include in-plant inventories, in-plant handling, plant warehouse costs, supply chain inventories, and supply chain warehousing costs.
5. **Cost of quality:** includes cost of validation, cost of performance drop due to poorer quality, and cost of incremental remedies to combat quality drop.
6. **Customer duties, value added-taxes, local tax incentives**
7. **Cost of risk, procurement staff, broker fees, infrastructure** (IT and facilities), and tooling and mold costs.
8. **Exchange rate** trends and their impact on cost.

Ferreira and Prokopets (2009) cited in Chopra and Meindl (2013)

Centralized Inventories

- **Rather than have a large number of local distribution centres, bringing these together at a small number of locations can save cost**
- Savings can be achieved in this way by:
 - coordinating inventory management across the supply pipeline.
 - Therefore duplication eliminated
 - safety stocks to be minimized,
 - thereby lowering logistics costs and overall distribution cycle times.
 - lower factory-to-warehouse distribution costs because shipments can be consolidated into full container loads.

Inventory centralisation against logistics costs and service dimensions



Harrison et al (2012)

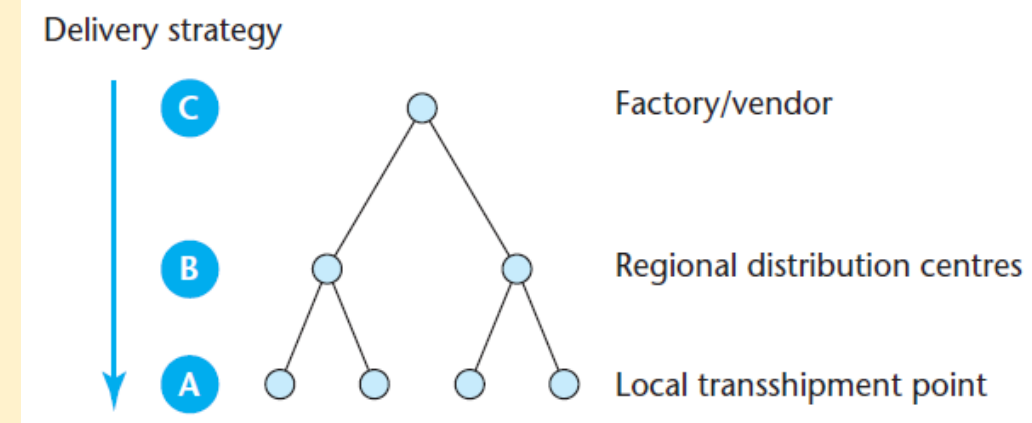
Example of Centralized Inventories

- Taking the European market as an example, the range is from local inventories (by country or even by location)
- Through international (a selection of countries) to the complete continent.
- Many companies now include the Middle East and Africa as a trading bloc (Europe, Middle East and Africa – EMEA).

- Philips has reduced its consumer electronics products warehouses in western Europe from 22 to just four.
- Likewise Apple Computers replaced their 13 national warehouses with two European RDCs.

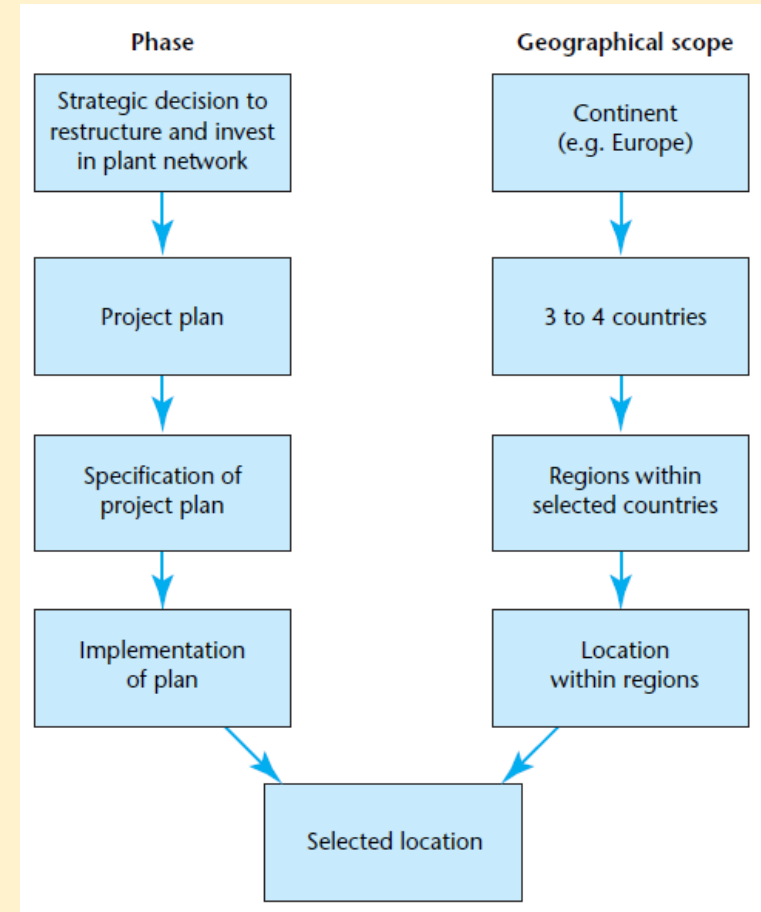
Delivery strategies in a global network

Delivery strategy	Description	Pros	Cons
A	Direct shipment of fast-moving, predictable lines. Held locally, probably pre-configured	Short lead time to customer	Multiple inventory points leading to duplication of stocks
B	Inventory of medium velocity, less predictable demand lines held at generic level awaiting final configuration	Lower overall levels of inventory, consolidated shipments to distribution centres and concentrated handling	Longer lead time to customers
C	Slowest-moving lines, least predictable. Perhaps one shared global inventory or make to order	Low overall inventory levels	Long lead time to customers



Phases in the location selection process

- Deciding where operations are going to be performed



Harrison et al (2012)

Four-phase decision-making process- Between Locations

1. Deciding upon the appropriate level of centralisation– decentralization
2. Deciding upon the appropriate level of centralisation– decentralization
3. Selecting criteria weightings
4. An economic trade-off analysis of structures and relevant locations

Location criteria	Weight	Score region A	Score region B
Railways	1	4	1
Water connections	1	4	1
Road connections	2	2	4
Site availability	2	2	3
Central location	3	1	2
...	...		
Total		19	22

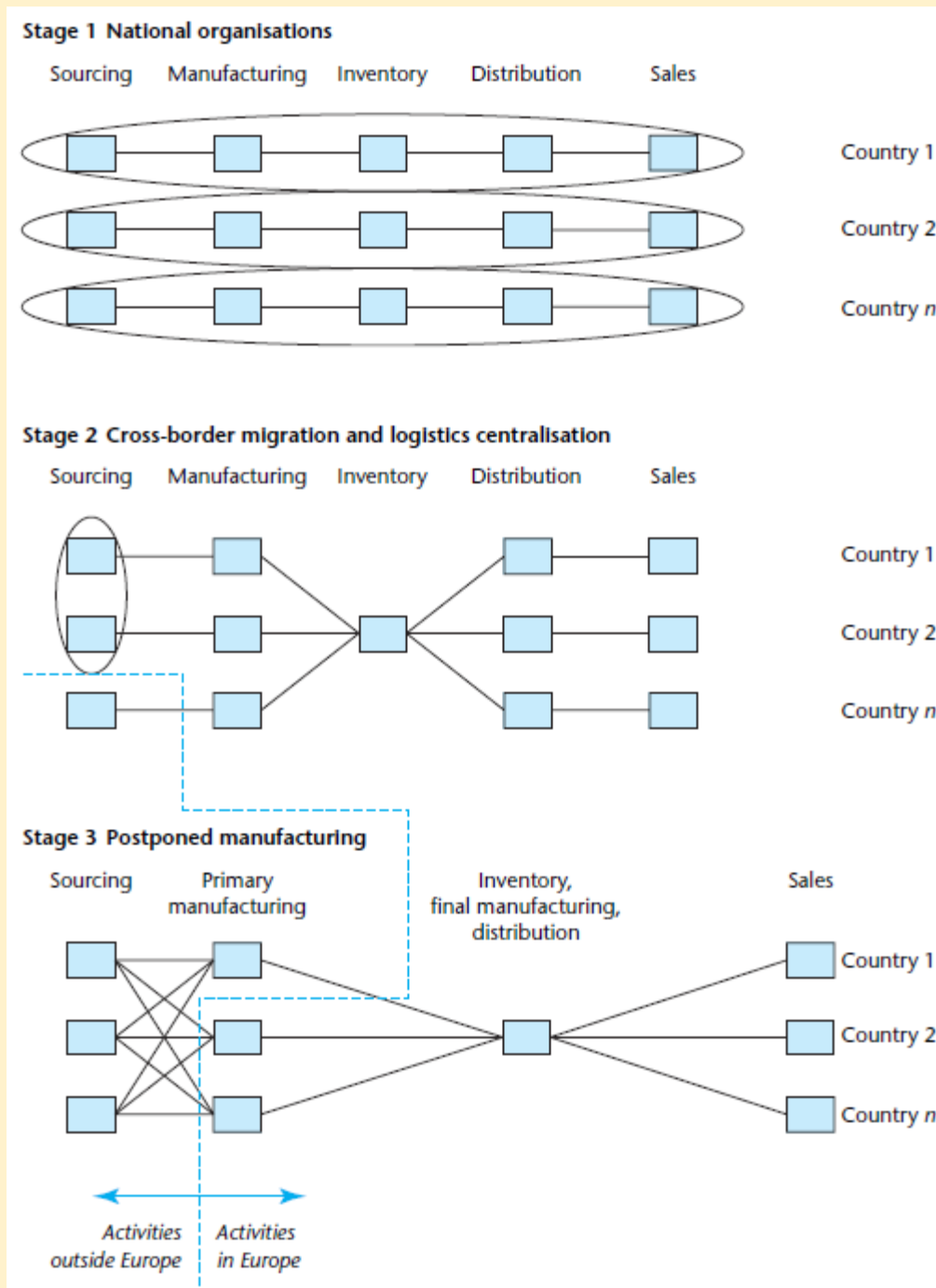
Key: Score on a five-point scale ranging from poor to excellent

Harrison et al (2012)

Layering and tiering

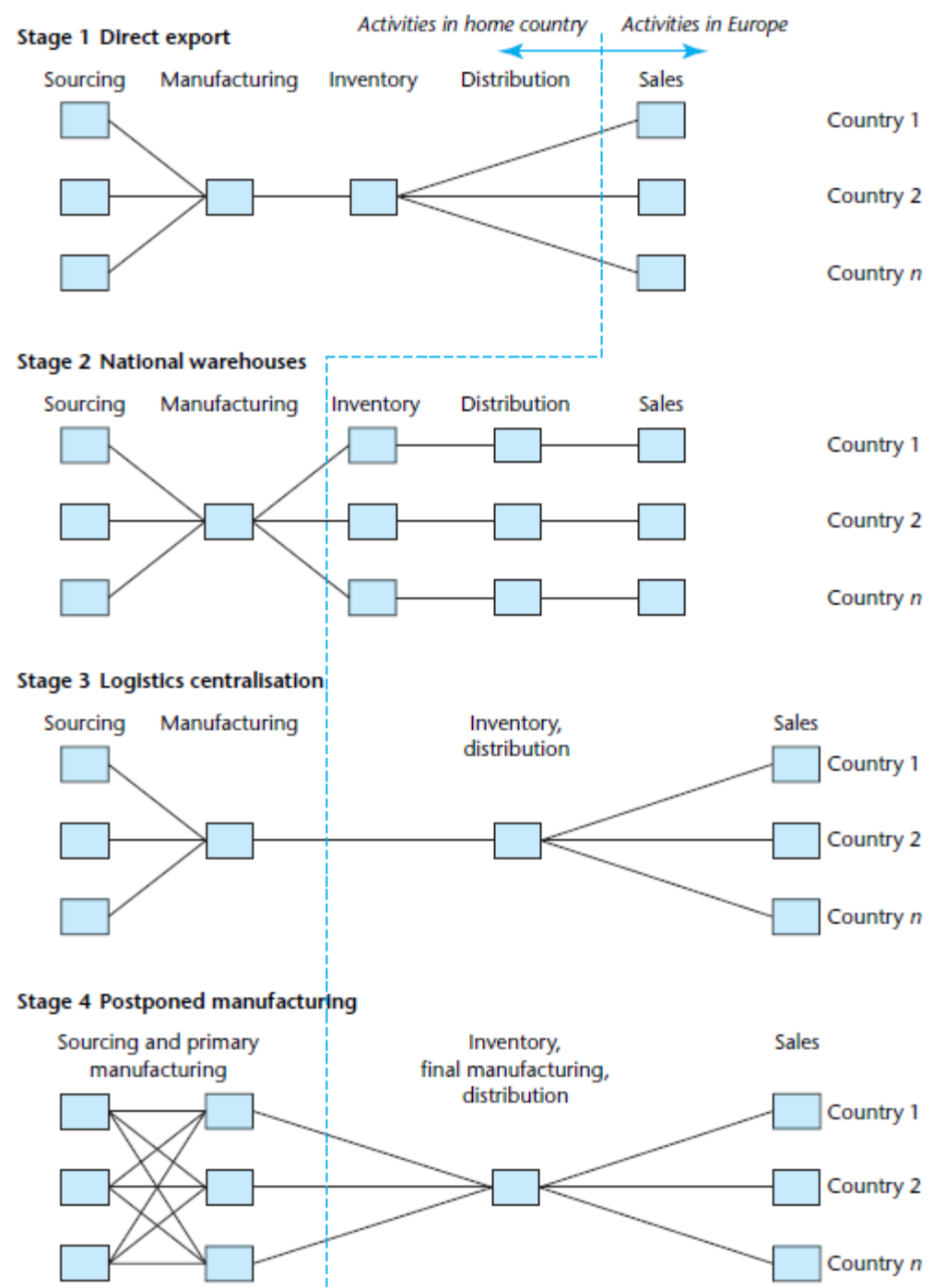
- Internationalisation is often looked at from the point of view of asset centralization and localisation.
- **Starting point:** Is the base structure localised or globalised?
 1. The path with a **localised starting point** - goes through centralisation within Europe starting from autonomous, duplicated local structures
 2. The path with a **global starting point** builds a small European presence and then migrates through the increase of European presence centrally

Stages in the implementation of postponed manufacturing: local starting point



Harrison et al (2012)

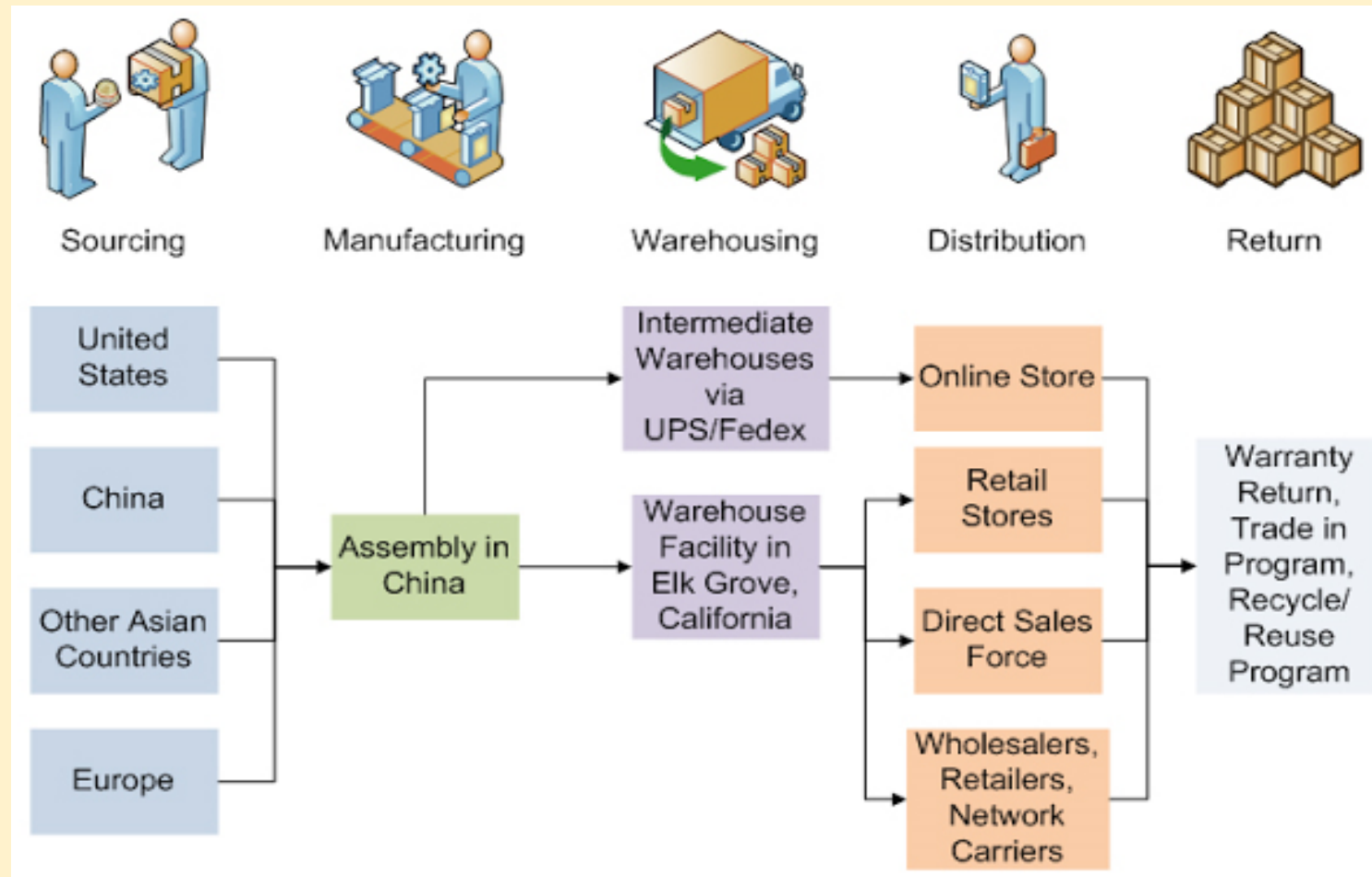
Stages in the implementation of postponed manufacturing: **global starting point**



Nike- Case Study

- Multi-product and Multi-jurisdictional company
- Manufacturing network has over 525 factories in 40 countries -Vietnam, China, and Indonesia, Thailand
- Sources most of its raw materials in the manufacturing host country by independent contractors
- Products move from several distribution centers across a network of thousands of retail accounts.
 - 6 primary distribution centers in the US
 - 67 distribution centers outside the US
- Nike-owned retail stores and digital platforms

Apple- Case Study



https://www.supplychain247.com/article/is_apples_supply_chain_a_risk/Apple

Unilever- Case Study

