

Project Risk & Supply Chain Risk

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Lecture 7



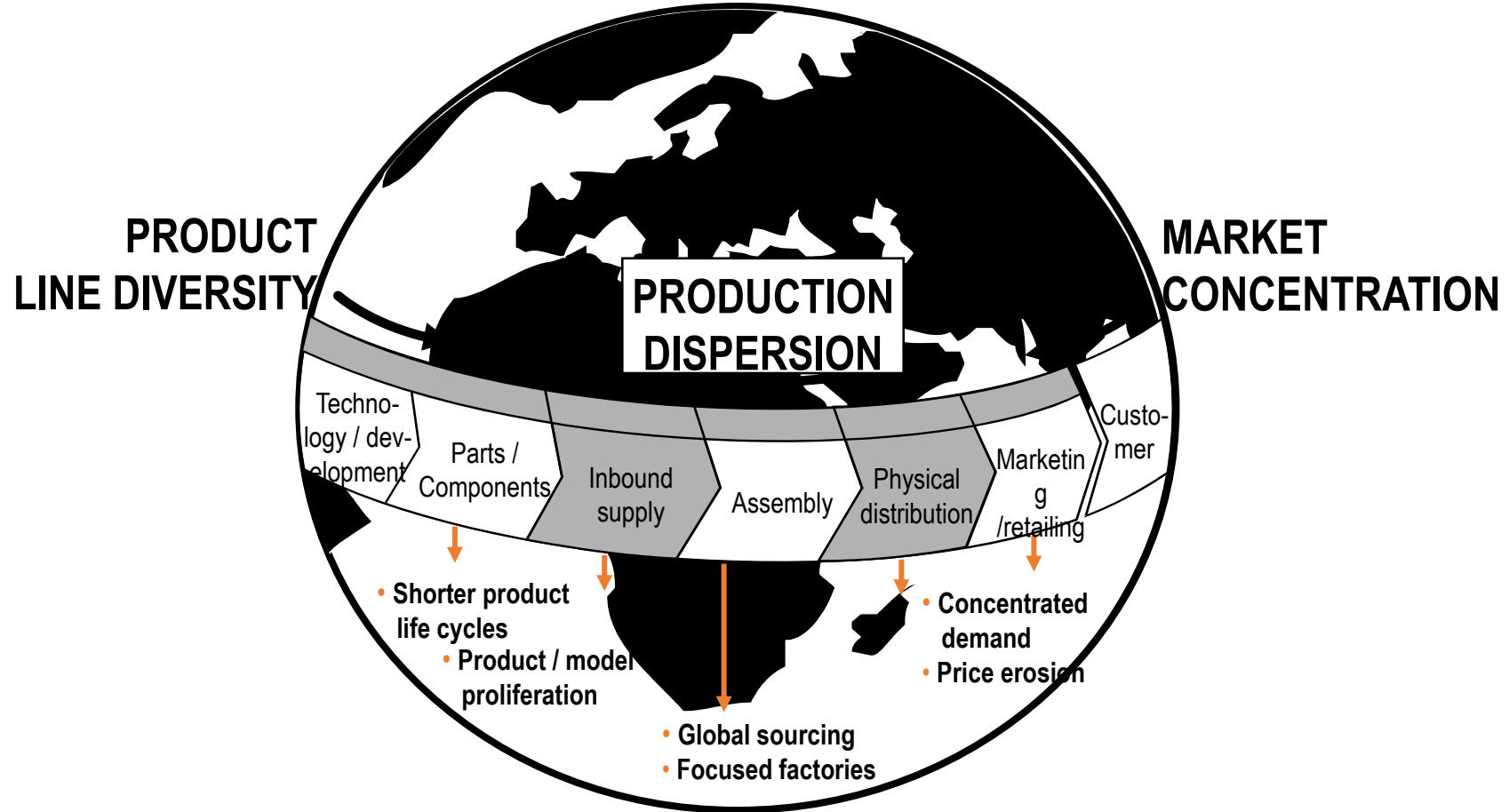
PMG 663
Project Risk & Supply Chain Risk



جامعة الجميع الذكية
EVERYONE'S SMART UNIVERSITY



The challenge of global logistics

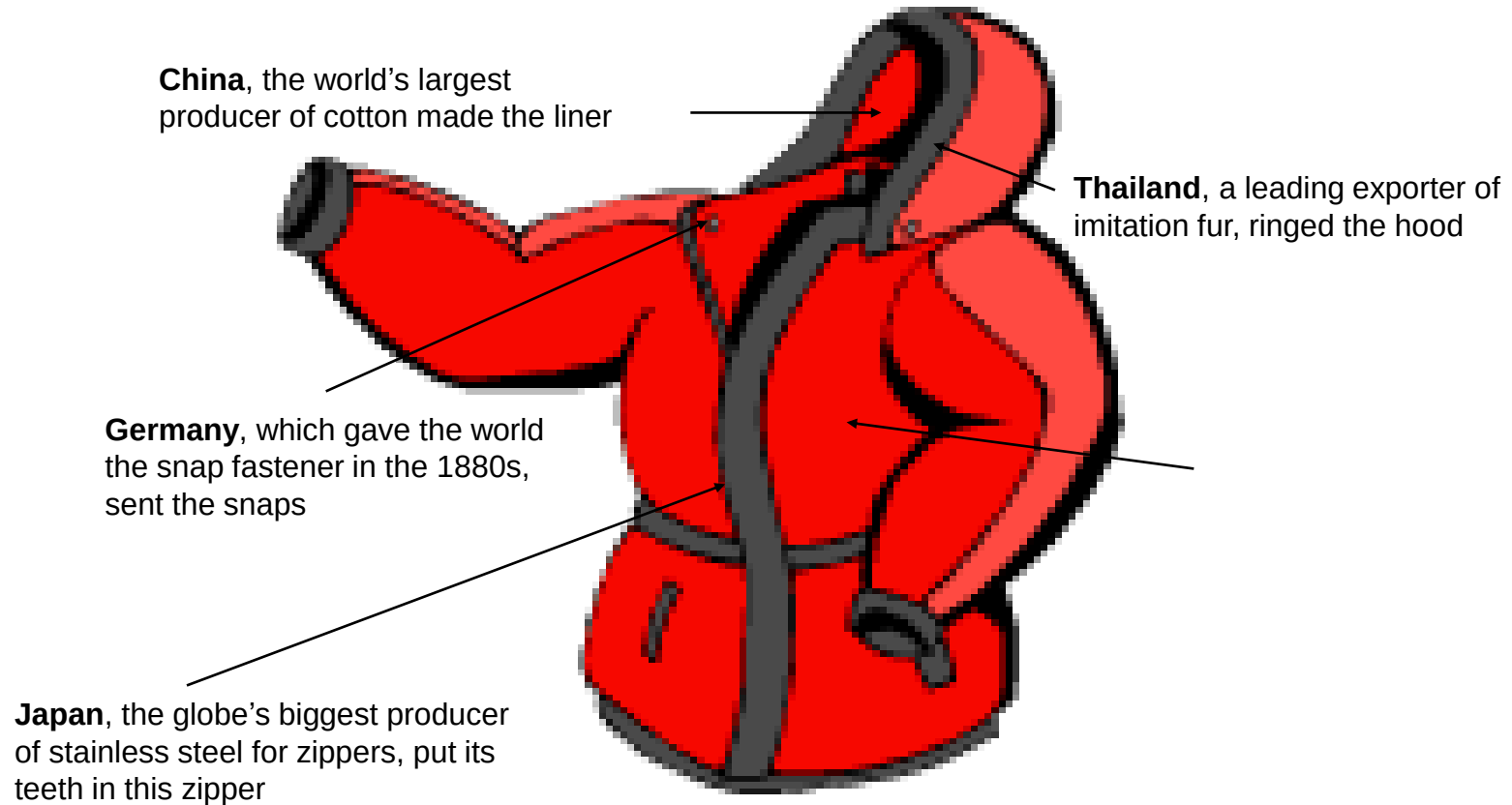


- Body shells from USA
- Motors from Brazil
- Drive Shafts from Italy
- Assembled in Taiwan
- Sold around the world



How many countries does it take to make a coat

To make this jacket for the UK market, Hong Kong garment producer Li & Fung ordered materials from factories in five Countries and had them delivered to Thailand, where the jacket was stitched together. Using a network of web-sites, Li & Fung stays in touch with its worldwide suppliers and can compress the time it takes to get items into stores.



The challenge of globalisation

Continued trends to off-shore sourcing and focused factories bring reduced costs to purchase/manufacture but

..... have the potential to increase total supply chain costs and to reduce agility.



Understanding the total costs of ownership

Not just the purchase price, but

- Increased transport costs
- Increased inventory financing costs
- Increased uncertainty of supply
- Longer lead-times
- Less visibility and increased likelihood of “bullwhip” effect
- Loss of control in quality
- Longer development cycles for new products
- Increased exposure to security risks

..... etc

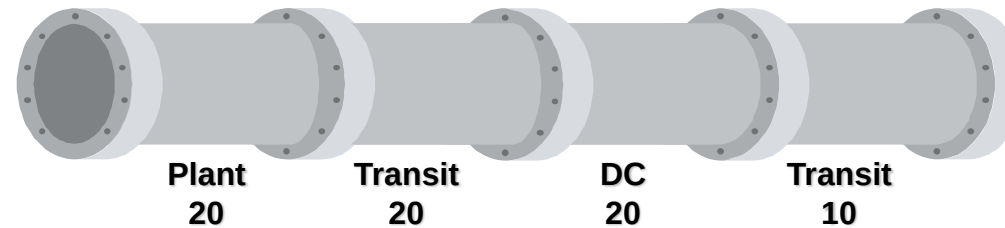


Pipeline Inventories

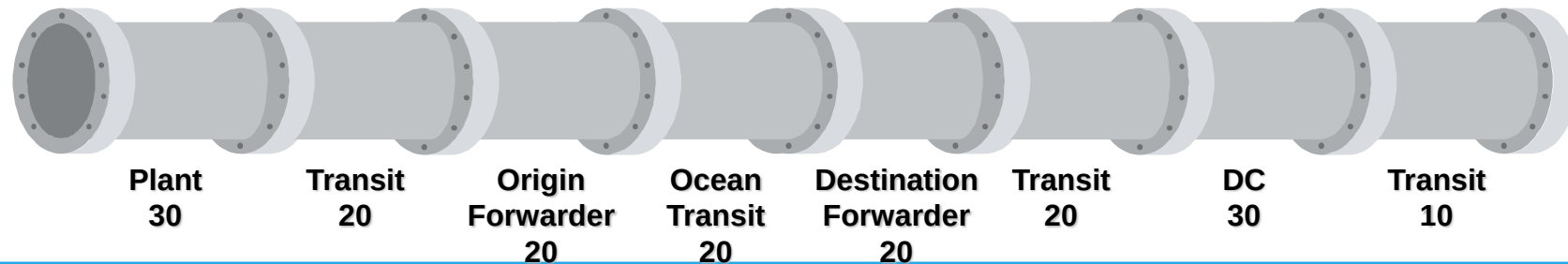
- Due to the length and increased uncertainty of global product pipelines, both planned and unplanned inventories may be higher than optimal

Illustrative inventory comparison: domestic vs. global product pipelines each with customer demand of 10 per week

Domestic Pipeline = 70 units inventory



Global Pipeline = 170 units inventory



- Map the supply chain

**have you ever wondered
where things come from?**



Managing supply chain risk

- Identify the critical paths



Managing supply chain risk

- Utilise cause and effect analysis (TQM tools)
- Implement supply chain event management
- Adopt agile practices
- Formalise supply chain risk management



Identify the critical path(s)

Critical paths are characterised by:-

- long lead-times
- no short-term alternative source of supply
- bottlenecks
- high levels of identifiable risk (i.e. supply, demand, process, control and environmental risk)



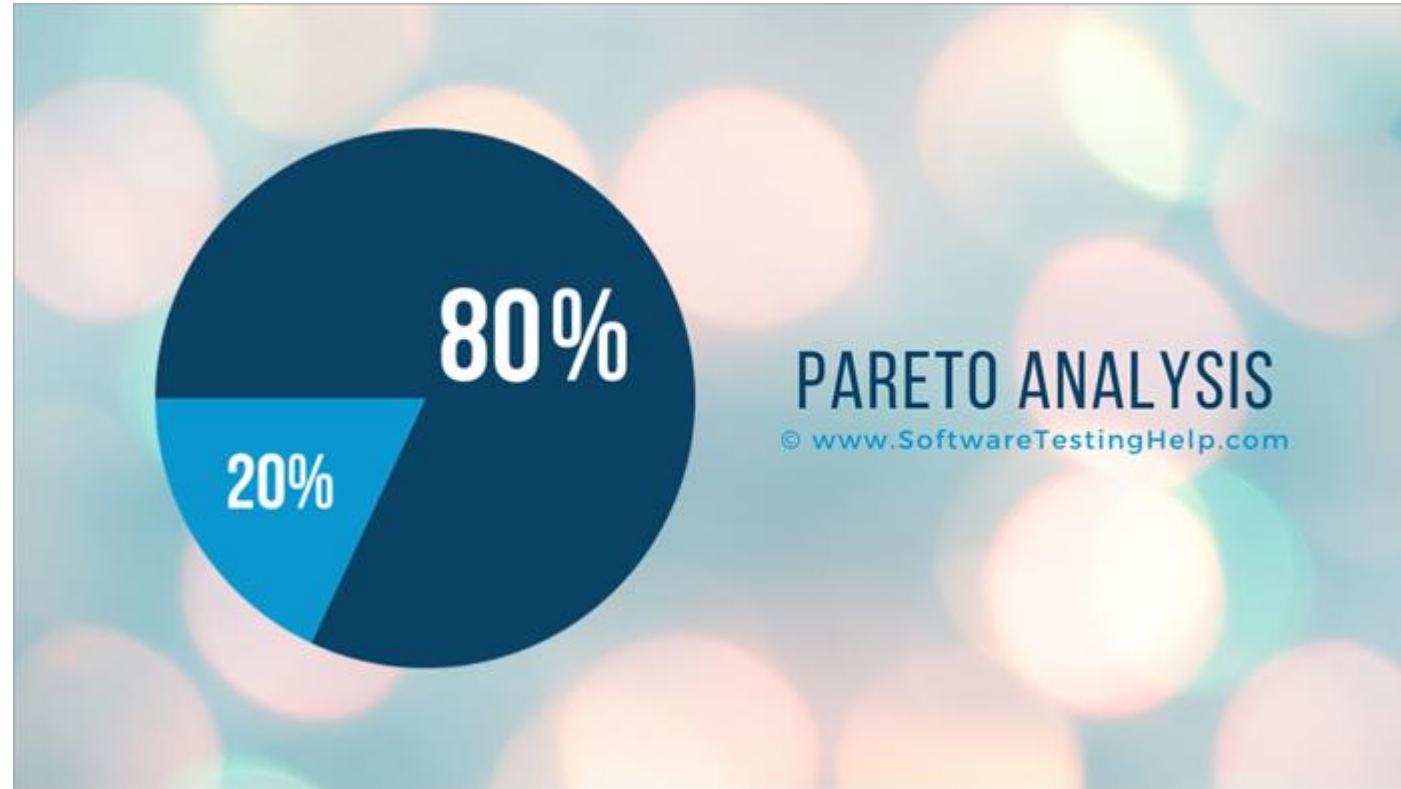
Use cause and effect analysis

- pareto analysis
- asking 'why?' five times
- fishbone charts
- failure mode and effects analysis



80% of disruptions will share 20% of the causes

أنّ الغالبية العظمى من
المشاكل (80%) تنتج
عن أسباب رئيسة معدودة
(20%)



Asking “why?” five times

1. Q. Why did the machine stop?
A. There was an overload and the fuse blew.
2. Q. Why was there an overload?
A. The bearing was not sufficiently lubricated.
3. Q. Why was it not sufficiently lubricated?
A. The lubrication pump was not pumping sufficiently.
4. Q. Why was it not pumping sufficiently?
A. The shaft of the pump was worn and rattling.
5. Q. Why was the shaft worn?
A. There was no strainer and metal scrap got in.

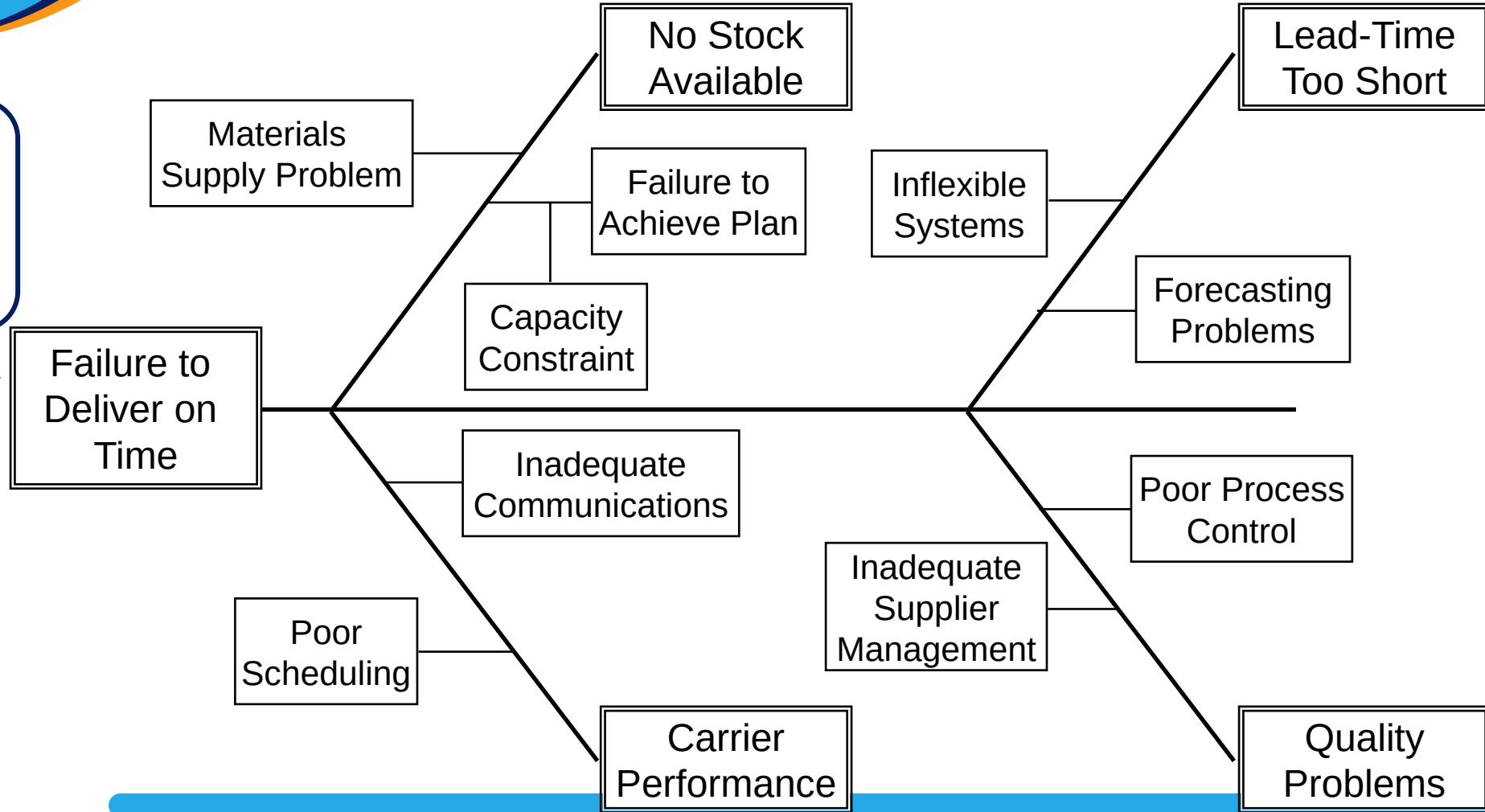
Repeating why five times like this can help uncover the root problem and correct it. If this procedure were not carried through, one might simply replace the fuse or the pump shaft. In that case the problem would reoccur in a few months.

Taiichi Ohno
Toyota Production System



Cause and effect analysis

fishbone
charts



Failure mode and effects analysis (FMEA)

- Asks three questions:
 - What could go wrong?
 - What effect would this failure have?
 - What are the key causes of this failure?
- Provides an assessment of risk for each possible failure:
 - S = severity of effect
 - O = likelihood of occurrence
 - D = likelihood of detection



S = Severity	1. no direct effect on operating service level 2. minor deterioration in operating service level 3. definite reduction in operating service level 4. serious deterioration in operating service level 5. operating service level approaches zero
O = Likelihood of occurrence	1. probability of once in many years 2. probability of once in many operating months 3. probability of once in some operating weeks 4. probability of weekly occurrence 5. probability of daily occurrence
D = Likelihood of detection	1. detectability is very high 2. considerable warning of failure before occurrence 3. some warning of failure before occurrence 4. little warning of failure before occurrence 5. detectability is effectively zero



Agile supply chains are designed to respond rapidly to unpredictable change. They are based upon a number of principles:-

- Very close connection to final marketplace
- Visibility of real demand
- High levels of synchronicity upstream and downstream



- Organisational focus on processes rather than functions
- Advanced level of collaborative planning with supply chain partners
- Continuous search for time compression opportunities



What Does it Take to Become More Agile? Zara

- Changed structure of network to working directly with more raw material suppliers that have the capability to produce the garments, hence considerably reducing manufacturing time and the risk of miss-communicating design briefs
- Advance technical improvements in raw material supply base and garment manufacturers in QR to meet market demands
- Direct sourcing means that companies have become more agile because the procurement process is much quicker and cost effective



- Sourcing a mixture of suppliers with various skills & with close proximity to market for QR and to enable late configuration of products
- Manage SC risk by avoiding a narrow supply base & enables them to switch product to avoid supply chain disruption caused by political or economic events, or natural disasters



- Both **fashion retailers** have integrated design into their supply chains in recognition that this mitigates risk and enhances supply chain agility
 - Starting design procurement process as close to each selling season
 - Avoid costs of storing finished products
 - Make last minute changes (late customisation) as receive trend information & utilise sales information from the current season – hence reducing time-to-market
 - Design-led procurement prevents the build up inventory & enables companies to be more responsive



- Designers are linked to the buying process and in control of design decisions
- By aligning design with the supply chain in this way, the companies have reduced their exposure to supply chain failure & ensured that suppliers are able to produce exactly what they require



Achieving Agility in The SC Through Design

- There are a number of critical principles underpinning design-led supply chains
 - The Supply chain 'begins on the drawing board'
 - Design is the start of the supply chain, not the end
 - Design must be integrative rather than functional orientation (silo)
 - Supplier integrated approach - (share product knowledge)
 - Multi-functional teams
 - Postponement & Planning
 - De-Coupling
 - Flexible

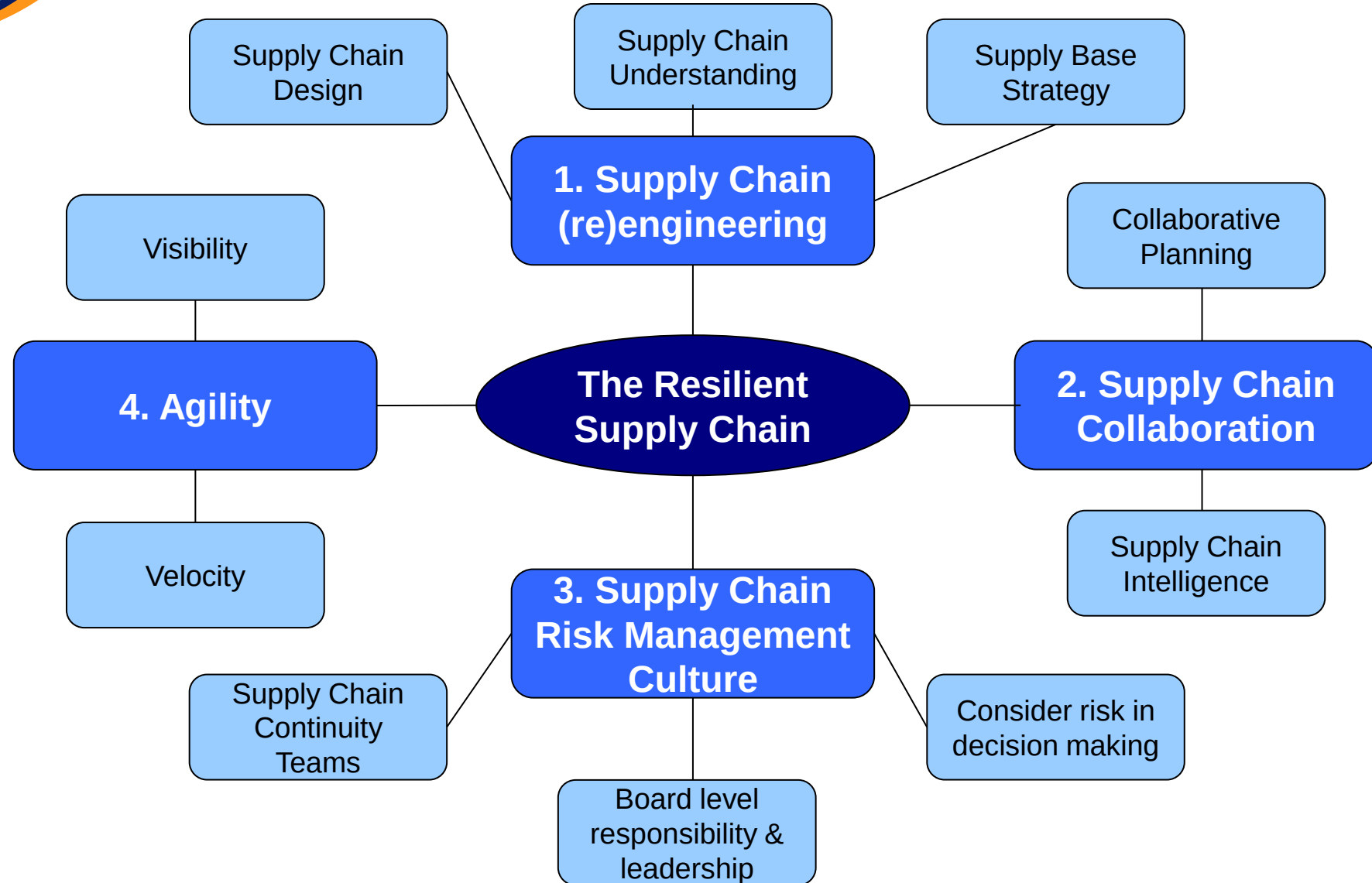


The importance of supply chain event management

- Supply chain visibility to enable potentially disruptive events to be identified as they happen – or even before they happen.
- Work as a supply chain community to define the business rules and exceptions that need to be monitored.
- Use shared information across the extended supply chain in as close to real time as possible to create supply chain intelligence.



Creating a Resilient Supply Chain: Strategic Approaches



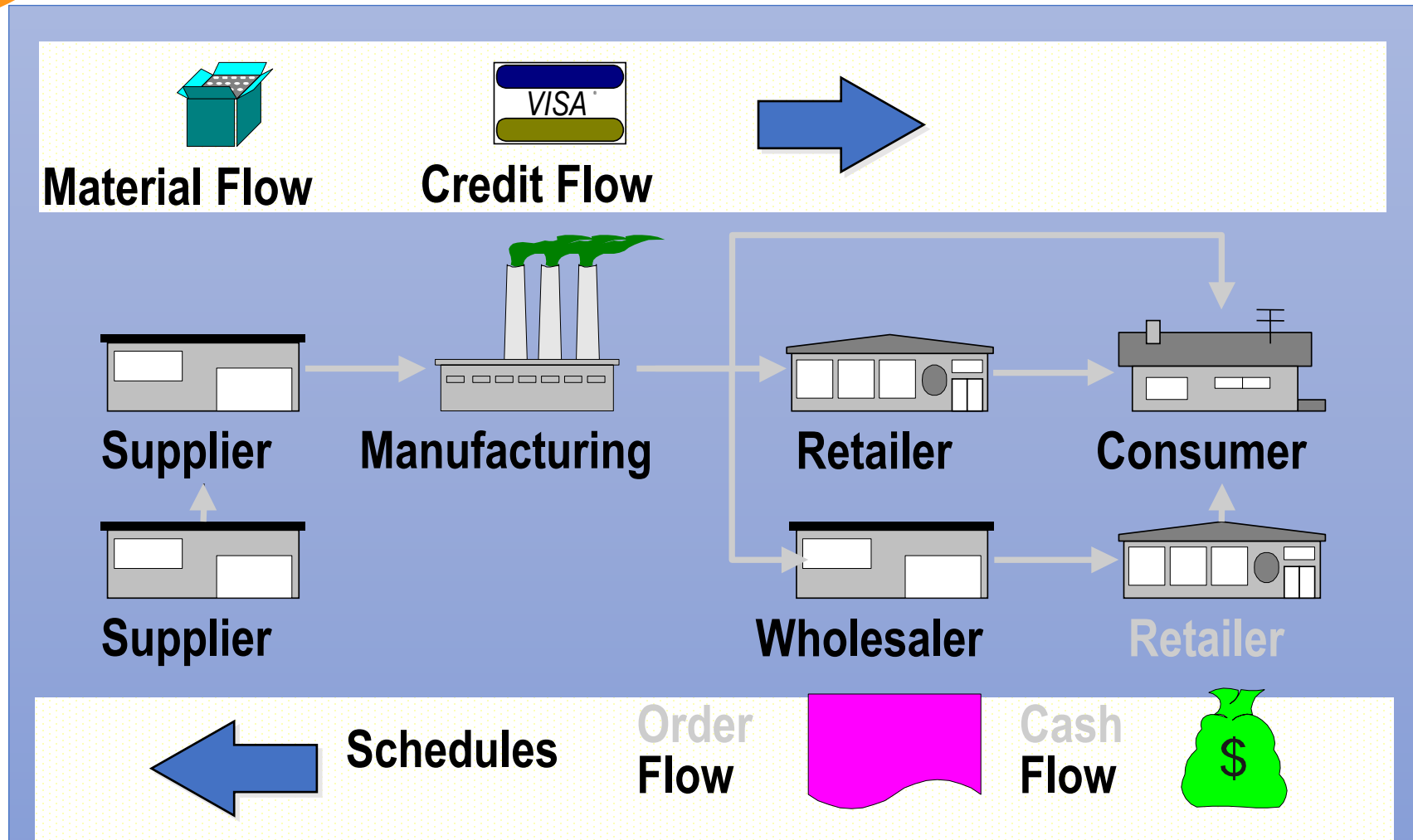
*“It is not the strongest of the species that
survive
nor the most intelligent, but the one most
responsive to change”.*



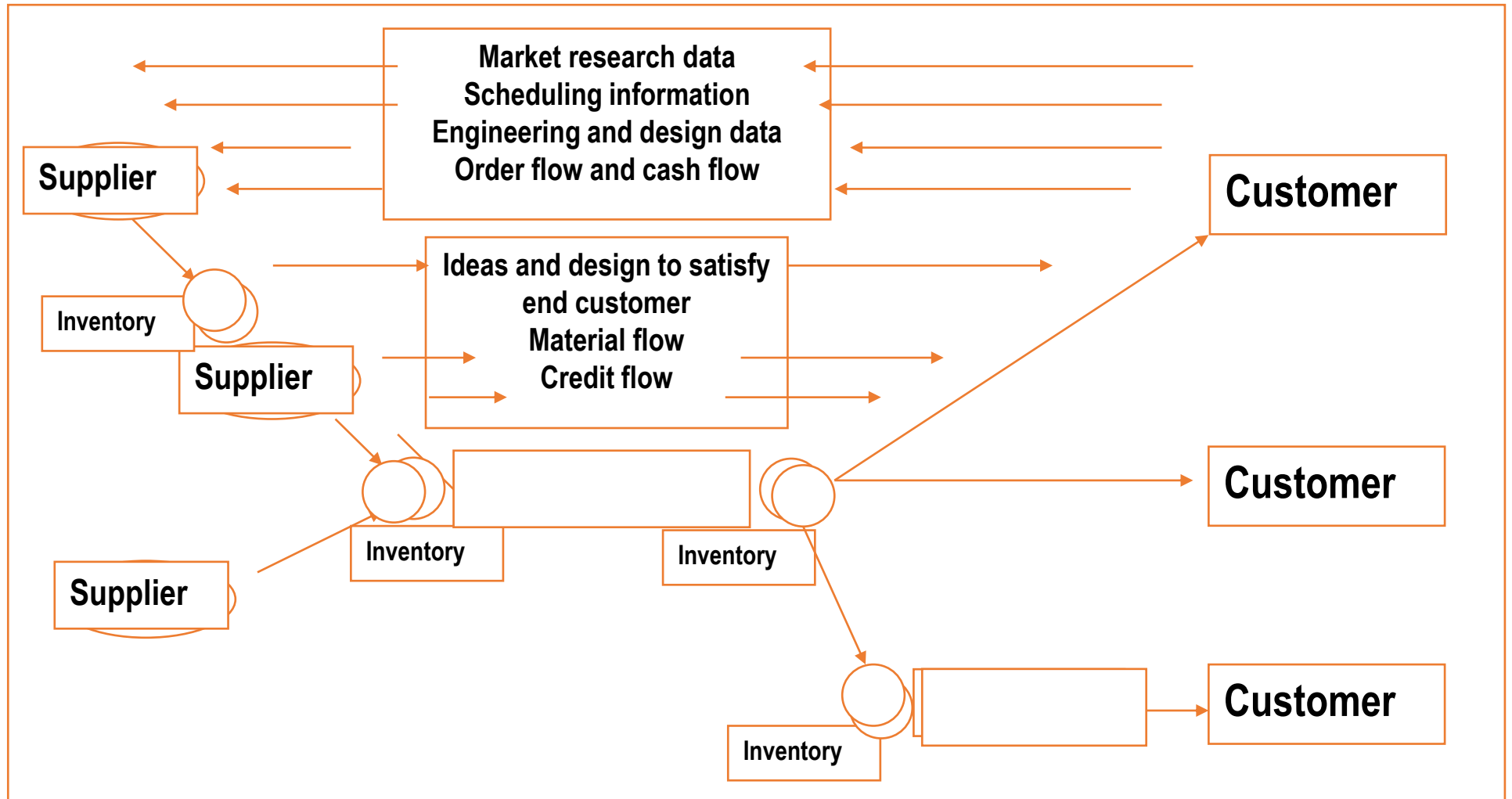
- Planning, organizing, directing, & controlling flows of materials
 - Begins with raw materials
 - Continues through internal operations
 - Ends with distribution of finished goods
- Involves everyone in supply-chain
 - Example: Your supplier's supplier
- Objective: Maximize value & lower waste



The Supply-Chain



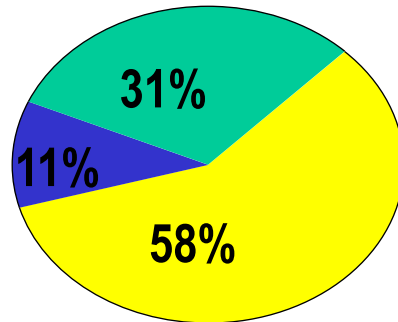
The Supply Chain



Material Costs in Supply-Chain

تكلفة
البضاعة
المباعة

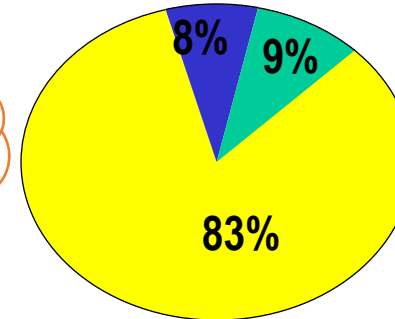
Manufacturing



Material
Dir Wages
Other

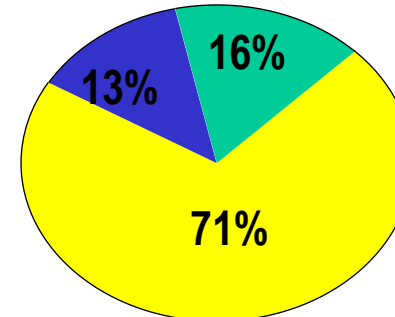
الاجور

Wholesale



COGS
Payroll
Other

Retail



COGS
Payroll
Other



Supplier's goal

Low Cost

Supply demand at lowest possible cost

Response

Respond quickly to changing requirements and demand to minimize stockouts

Differentiation

Share market research; jointly develop products and options

Primary Selection Criteria

Select primarily for cost

Select primarily for capacity, speed, and flexibility

Select primarily for product development skills



	<u>Low Cost</u>	<u>Response</u>	<u>Differentiation</u>
Process Characteristics	Maintain high average utilization	Invest in excess capacity and flexible processes	Modular processes that lend themselves to mass customization
Inventory Characteristics	Minimize inventory throughout the chain to hold down costs	Develop responsive system, with buffer stocks positioned to ensure supply	Minimize inventory in the chain to avoid obsolescence



	<u>Low Cost</u>	<u>Response</u>	<u>Differentiation</u>
Lead-time Characteristics	Shorten lead-time as long as it does not increase costs	Invest aggressively to reduce production lead-time	Invest aggressively to reduce development lead-time
Product-design Characteristics	Maximize performance and minimize cost	Use product designs that lead to low set-up time and rapid production ramp-up	Use modular design to postpone product differentiation for as long as possible



Supply chains in a global environment must be:

- Flexible enough to react to sudden changes in parts availability, distribution, or shipping channels, import duties, and currency rates
- Able to use the latest computer and transmission technologies to schedule and manage the shipment of parts in and finished products out
- Staffed with local specialists to handle duties, trade, freight, customs and political issues



[Why Global Supply Chains May Never Be the Same | A WSJ Documentary - YouTube](#)

