

### Global Optimisation of the principal Global Supply chains of NZ

To restructure and realign the Global Supply Chain Assets and operations of the Key shippers, Gateway Ports , Dry Ports, Freight & Inland Hubs of New Zealand



To be read in conjunction  
with Part 2A

#### PART 2 B

SUPERIMPOSING THE GLOBAL SUPPLY CHAINS  
ON THE GLOBAL TRANSPORTATION CORRIDORS

**THE LEAN AGILE GLOBAL SUPPLY CHAIN  
MANAGING THE CONFLICTS BETWEEN  
BEING LEAN UPSTREAM AND AGILE DOWNSTREAM**

A topline presentation for C-SUITE Managers

By

Allan Rodrigues

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Allan Rodrigues retired honourably from the Indian Navy in 1994 after serving 21 years. He is the Sword of Honour of his course and winner of the Lentaigne Medal at the Defence Services Staff College in Wellington India. During his Naval Career he has commanded IN Ships Nipat, Himgiri, and Subhadra. He has also been the 'Commander Work-up and Sea Training' of the Western Fleet and the Second in Command (XO) and Chief Instructor of the Naval Academy INS Mandovi. He was cleared for promotion to Captain but chose to join industry. He migrated to New Zealand in 1995.

In New Zealand, Allan has been a senior manager and C-SUITE 'board level' senior Management Consultant. He specialises in aligning strategy, finance, operations, decision engineering and performance management. Over the last 30 years Allan has been the lead management consultant for several major multi-million dollar projects over a range of industry sectors including the development and analytics for the reform of the sea and inland port & freight hub sector, the alignment of key supply chain hubs and assets across New Zealand to increase supply velocity, value based projects for the TV satellite and broadcasting sector, major electricity utilities, kiwifruit and agronomy, a review of the captive insurance sector, a benchmarking project for a major Australian Bank and technology start-ups under risk. He has designed a 4<sup>th</sup> generation Balanced Scorecard and an IT Portfolio Management Financial Model. Amongst the major projects he has undertaken is a 'Real Options' valuation of a major section of the national electricity grid in New Zealand, a valuation of the worldwide marketplace for the satellite 'occasional-use' time sensitive carriage of news and sports, strategic alliances and several strategic planning and valuation projects under risk and uncertainty.

Allan's qualifications include an MSc (Defence Studies) University of Madras (Lentaigne Medal) and an MBA (Elective Finance) from Henley Management College and Business School, Oxford on Thames, Oxfordshire U.K. He is a noted industry based adjunct professor who has been invited to both lecture (and guest lecture) at the master's degree level at universities in New Zealand and Australia over a period of twenty years from 2001 to 2021. He has conducted advanced logistics and supply chain governance advisories for senior operations/supply chain managers of the major NZ companies and defence services on behalf of the Centre for Supply Chain Excellence (CSCE) at the University of Auckland. He is currently the MD of The Business Binnacle Ltd ([www.thebusinessbinnacle.co.nz](http://www.thebusinessbinnacle.co.nz)) a management consulting practice. He is currently semi-retired from full-on consulting work.

The project was current during the timeline it was compiled and remains so for the most part. Whilst the data in some cases may be outdated, the underlying analytical methodology is current in many cases. Nevertheless, these methodologies need to be periodically peer-reviewed.

Many of the tools used have been obtained and adapted from peer-reviewed sources. The work of Professor(s) Simchi-Levi, (Wharton) on the 'global optimisation' of the GSCs, Theo Notteboom (Maritime Institute, Univ of Antwerp) and Jean Paul Rodrigue (Texas A & M) on port reform and the port eco-systems, Michael Porter (Harvard) on Value Chains and competitive advantage, Kaplan & Norton on strategy mapping and the balanced score card, G. Bennett Stewart, on Economic Value Added (EVA), Ashwath Damodaran on valuations under risk and uncertainty, Dixit and Pindyck on 'Investments under uncertainty', Kulatilaka & Abrams on 'Real Options' feature across all four presentations. The work of Yves Doz & Gary Hamel on Strategic Alliances, Kenichi Ohmae, Simon Benninga (Wharton) on Finance and Strategy, all master strategists in their own right feature in the detail in presentations 2 to 4.

The author has also used his own work on the nexus of the value chain and supply chains, the de-aggregation of value chains and the 4G Balanced Score Card to inform this project. All models that have been used or adapted have been referenced. They feature at various places in the presentations.

The Author thanks the many senior managers past and present on the C-suite of many of New Zealand's large Sea Ports, Inland Ports, Dry ports and Freight hubs and the principal shippers of the main New Zealand export companies for sharing their practical and hands-on experience in operating and managing some of the most complex global supply chains in the world. Many of the models developed by the doyens of the Global Supply Chains in academia were adapted for this project using the hands-on knowledge of these practitioners in the marketplace

In particular the seminal work by Professor(s) Simchi-Levi, Gerard Cachon and Christian Terwiesch from the Wharton School University of Pennsylvania are acknowledged. Their models on Global Optimisation have been adapted by the author and feature prominently.

# Abbreviations

ABBREVIATIONS AND TERMINOLOGY.			ABBREVIATIONS AND TERMINOLOGY.		
Log design	DFA	DESIGN FOR ASSEMBLY	Log Trade off	CS	CUSTOMER SERVICE
Log design	DFL	DESIGN FOR LOGISTICS	Log Trade off	ERU	EFFICIENT, RESOURCE UTILIZATION
Log design	DFM	DESIGN FOR MANUFACTURING	Log Trade off	QoS	QUALITY OF SERVICE
			Log Trade off	VOB	VOICE OF THE BUSINESS
Log Innovation	I	INCREMENTAL INNOVATION	Log Trade off	VOC	VOICE OF THE CUSTOMER
Log Innovation	R	RADICAL INNOVATION			
			Log types	1 PL	FIRST PARTY LOGISTICS
Log Operations	CM	CONTRACT MANUFACTURER	Log types	2 PL	SECOND PARTY LOGISTICS
Log types	DIFOT	DELIVER-IN FULL-ON TIME	Log types	3 PL	THIRD BODY LOGISTICS
Log Operations	MANUF	MANUFACTURING	Log types	4 PL	FOURTH PARTY LOGISTICS
Log Operations	OBM	ORIGINAL BRAND MANUFACTURER	Log types	CRL	CONTINUOUS REPLACEMENT LOGISTICS
Log Operations	ODM	ORIGINAL DESIGN MANUFACTURER	Log types	RRL	RAPID REPLACEMENT LOGISTICS
Log Operations	OEM	ORIGINAL EQUIPMENT MANUFACTURER			
Log Operations	VAR	VALUE ADDED RESELLER	Port Eco Systems	CT	CONTAINER OR BOX
Log Operations	VMI	VENDOR MANAGED INVENTORY	Port Eco Systems	PES	PES PORT ECO SYSTEM
			Port Eco Systems	VAFS	VALUE ADDED FACILITIES
Log Strategy	GSC	GLOBAL SUPPLY CHAINS	Port Eco Systems	VALS	VALUE ADDED LOGISTICS
Log Strategy	LSC	LOCAL SUPPLY CHAIN			
Log Strategy	SVC	STRATEGIC VALUE CHAIN			

# PRESENTATION PART 2A

## THE LEAN AGILE GLOBAL SUPPLY CHAIN



**MANAGING THE CONFLICTS BETWEEN  
BEING LEAN UPSTREAM AND AGILE DOWNSTREAM**

**SUPERIMPOSING THE GLOBAL SUPPLY CHAINS  
ON THE GLOBAL TRANSPORTATION CORRIDORS**

Presentation 2 on the GSCs is content heavy.  
It has been divided into 2 parts Part 2A and Part 2B  
The parts are for convenience in dissemination.  
and need to be read as a single continuous document.

### Opening Comment.

**Note. The presentations may seem a bit crowded and dense. They are designed to be so.**

The original project papers including the reports and presentations continue to be commercially sensitive and have been redacted. Rather than rewrite a formal report compiling the various methodologies and findings and for the sake of convenience in dissemination, **the original presentation slides created for various forums have been repurposed, but with explanatory notes included** for the benefit of lay readers and non-supply chain specialists. **The author has designed the presentations to be a full document and to be readable 'as-is' in pdf without added notes.**

This series of four presentations have been compiled pro-bono to demonstrate the broad ideation funnel used by some of the global supply chains of the world, as a way of educating and training senior managers on the current work being done at the coal face of many of the modern supply and value chains of the world.

The author advises caution with their use. There is a need for peer review and constant updating. Many globalisation strategies have come under fire post 2016 and the pandemic. Nevertheless, the 'Global Optimisation' innovation developed by the many doyens in the field, are just as easily used locally in a single country, or geography, as well as internationally.

# The Lean- Agile Global (or Local) Supply Chains (GSCs & LSCs) & their impact on the Global Transportation Corridors

These FOUR presentations capture the Architecture and Construct of the **LEAN AGILE GSCs** in tandem with the efficient management of Sea Ports or Inland Ports or Freight Hubs on the **GLOBAL TRANSPORTATION CORRIDORS**. Whilst they do delve into the asset management and operations processes of Sea and Inland Ports, the focus in this section is on the GSCs and their sea-land transportation rhythm and cadence

All four documents are densely packed as presentation cum data documents laid out in ways that combine the knowledge, data and findings from several investigative reports and presentations written and delivered over a long arc of several years by the author, with inputs from the port and supply chain analysts on the team. The nexus between the GSCs of the world and the Sea/Inland ports on the transportation corridors that interlink the global supply chains going outward or inward to and from New Zealand, and the conflict with the Strategic Value Chains of the individual GSC members have been drawn out by the author in some detail for the first time.

All four presentations cum data- documents answer the question

“ What do Lean-agile Global (or Local) Supply Chains need from the various nodes and hubs on the world’s transportation corridors, so that they can manage the conflict between cost efficiency on the one hand and high agility (or High Fulfilment) on the other?”

The conflict on their value chains is addresses in Presentation 3 of this series

# CASE 4 The hybrid strategy Furniture Industry

## Some Push – some Pull

Harvey Norman

CM  
in China

PUSH STRATEGY

Low

Uncertainty

2

The order for the couches are sent to China. The wood, leather, fabric etc are stocked in bulk. Inventory at bulk level is cheap and can be ordered with almost no lead time.. They are made with a day or two. They then wait transportation **THIS IS MADE TO ORDER FROM HUNDREDS OF DESIGN THIS IS PULL STRATEGY AS WELL**

PULL STRATEGY

Retailer in  
Auckland

High  
Uncertainty

1



A Furniture Brand offers Customers wide **choice of hundreds of types of sofa sets in its annual catalogue**, but it does not hold them in inventory at its stores **THIS IS A PULL STRATEGY**

BUT Competitive Pricing is only for the combination of 2x seater + 3x seater couch combinations .. They hold some inventory and offer to make the rest from scratch with 2-3 weeks waiting time

PUSH PULL  
Boundary

### THE CONFLICT BETWEEN PUSH AND PULL IN THIS CASE IS MANAGED IN TRANSPORTATION

1. The two + seater are designed for logistics .
2. There are made in parts. They fold into each other and are only assembled nearer the Distributor/Retailer
3. . Their dimensions are designed to find the best combination that will fit into a 40 foot container
4. **THE PUSH VOLUME EFFICIENCY COMES FROM TRANSPORTATION EFFICIENCY**





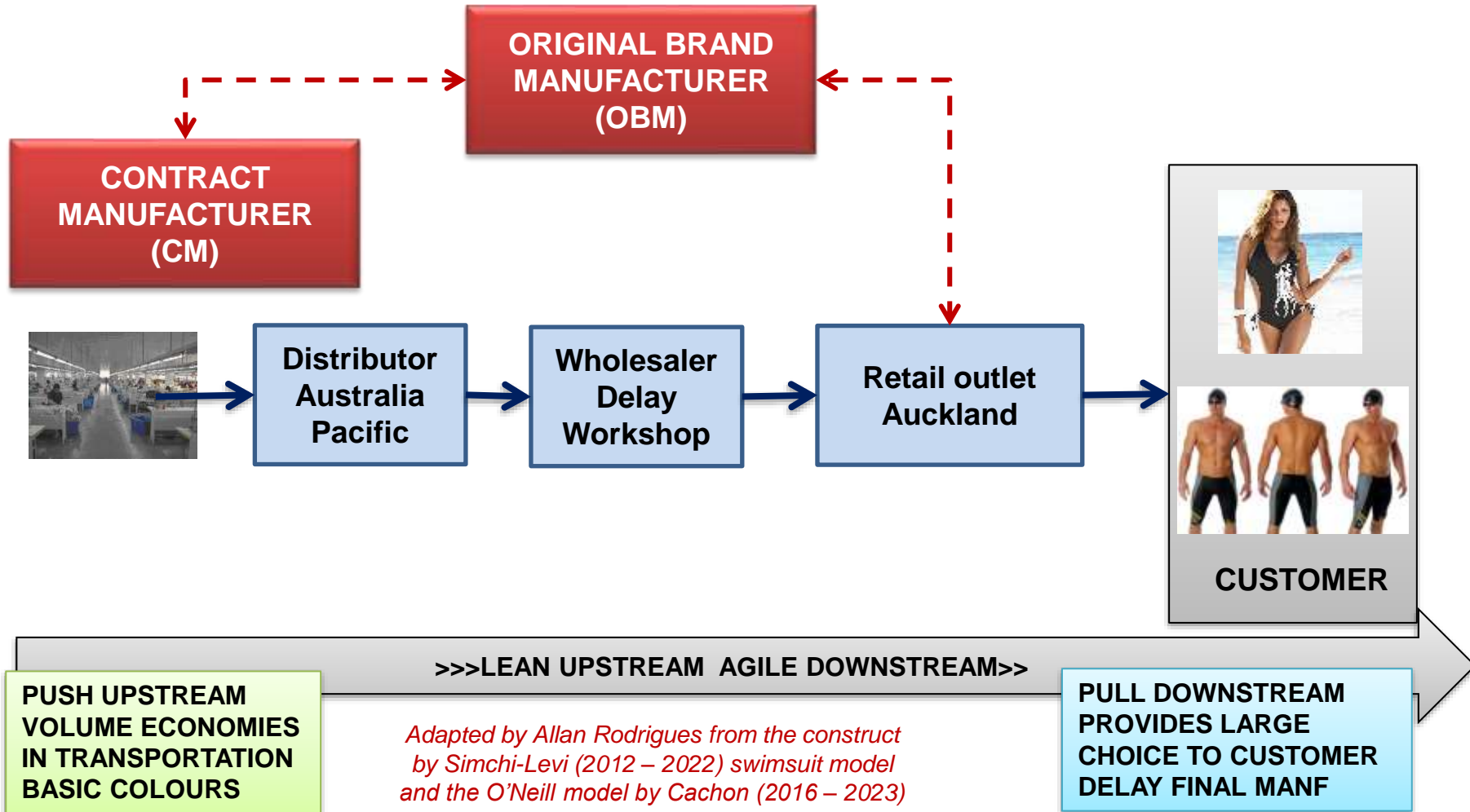
Global Optimisation is a technique that takes an unbiased decision-making view of the GSC so that all members shares a fair part of the value

- ❑ GSCs begin at the birth of her product upstream at the level of the individual parts and finishes far downstream where it is disposed of/recycled in different countries. At different points value is added by different players and companies each in their own right. They cross international and ownership boundaries and are most effective when their supply chains work cooperatively. Sharing knowledge creates efficiency and effectiveness
- ❑ **Problem 1.** Companies wield power on the GSC based on the competitive advantage in their own marketplace. They then demand higher margins than the other members. Some CMs and ODMs are well known brands. **This creates an imbalance in how value is shared on a supply chain, even though the product is owned by an original brand manufacturer [OBM].**
- ❑ There is a conflict between being lean upstream as the contract manufacturers [CMs] prefer high volumes to bring manufacturing costs down. Conversely the distributors and especially the retailers want to hold minimum inventory to avoid having unsold stock. THE GLOBAL OPTIMISATION CONSTRUCT ADDRESSES THIS ISSUE. The only way of avoiding this conflict is to globally optimise the supply chain in a way that takes an 'outside-in view' of how risk, reward and gain shares are to be agreed to.
- ❑ **Problem 2.** **Sharing information is risky.** A member on the GSC armed with information provided by another member, will use the information to take over the operations off the other member. This **misuse of information causes vertical supply chain invasions**, Many members of the GSC are great big companies. Ergo, supply chain partners dislike sharing information although they recognise that they need to do so to be efficient.
- ❑ The solution is to manage the conflict on the Strategic Value Chain (SVC) of each firm [**see presentation 3 in thee series**]. It addresses the issue of insourcing, outsourcing, the use of 3PL and 4PL providers, and on how to protect the value chain.

A Global Optimisation (GO) supply contract is designed to ensure that all parties share value based on a 'risk versus reward' model



# CASE 5 & 6 The Fashion Industry 'Delay Manufacturing + Global Optimisation' Construct



# CASE 5 & 6 The fashion industry

## 2 Victoria's swimsuits Ltd (a fictional story)

OBM outsources to a CM in China who Manf the garment in CUT PIECES in NEUTRAL COLOUR all sizes, With NO DESIGN IMPRINTED

OBM designs the product with HIGH QUALITY MATERIAL and estimates the demand e.g. 5000 swimsuits

**CM Manf TWICE the QTY 10,000 suits to bring volume efficiency BUT creates HIGH INVENTORY**

Feedback loop from Retailer on which colours are purchased by the customer and which are not

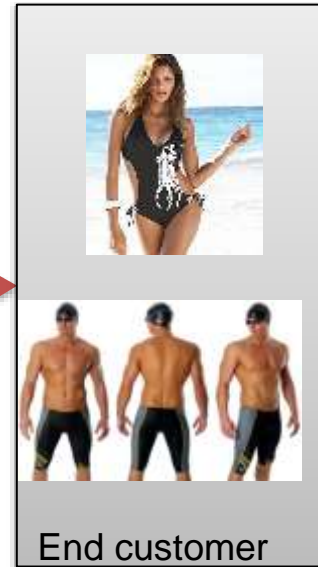
**3**  
Distributor  
Australia  
Pacific

**4**  
Wholesaler  
Delay  
Workshop

**5**  
Retail outlet  
Auckland

High Inventory is sent to all Distributors and to the Wholesalers who have the final assembly tailoring print machines.  
**MINIMAL INVENTORY IS FINISHED**

Retailer stocks double the inventory of all items so that there are no stock outs.



End customer

**PUSH UPSTREAM VOLUME ECONOMIES IN TRANSPORTATION BASIC COLOURS**

>>>LEAN UPSTREAM AGILE DOWNSTREAM>>>

**PULL DOWNSTREAM PROVIDES LARGE CHOICE TO CUSTOMER DELAY FINAL MANF**



Manufacturing in China

# CASE 5 & 6 Global Optimisation and Delay Completion combined Fashion Industry Simchi-Levi Swimsuit model

**PUSH**

**PUSH PULL**

**PULL**

## PART 1 DELAY MANUFACTURING

- ❑ The OBM (Original Brand Manufacturer) takes extensive feedback from customers and designs high quality apparel with high quality material that is much sought after,
- ❑ A series of probabilities are calculated around initial demand. Thereafter instead of Manuf the estimated demand, the CM is asked to produce double the QTY. to bring Manf cost down (volume efficiency) but it doubles the inventory costs holding and transportation costs.
- ❑ The items are Manuf in separate pieces, in neutral colours with no design and sent in flat packs to the Distributor
- ❑ Samples of the finished designs are unveiled at the retailers about 3 months in advance. Customer choices are noted by seeing which ones are picked up even if they are not purchased.
- ❑ Final printing of designs and joining up of the garment is undertaken at the final stage workshop (wholesaler) on those designs popular with the customer. Designs that are not popular are discarded.
- ❑ This reduces the wastage of stock which would have been lying unsold



- ❑ **HOWEVER, THE SUPPLY CHAIN IS CARRYING DOUBLE THE INVENTORY TO KEEP IT 'LEAN UPSTREAM' SO THAT IT CAN START AT THE LOWEST COST**
- ❑ The Retailer in particular is forced to carry finished inventory unsold at high cost. An even heavier burden is placed on the Wholesaler who is holding the stock in cut pieces and neutral waiting to be finished.
- ❑ It is this excess stock that allows the Supply Chain to be AGILE and be able to ramp up to higher demand at short notice. A particular design might sell another might not. The Delay Manuf workshop can be geared to ramp production of the popular items at short notice.
- ❑ **BUT THERE IS STILL TWICE THE QTY HELD IN THE SYSTEM – THIS IS THE GLOBAL OPTIMISATION CHALLENGE** (See Next pages)

# CASE 5 & 6 The Globalisation Construct simplified for the swimsuit model Lean Agile Supply Chains

In this high inventory model, the Manuf cost comes down to \$ 35. The CM transfers the cut pieces to the DISTRIB for \$ 50.

Each node charges a profit on the value boundary until it reaches the Retailer as a finished product. The retailer buys at \$ 95 and sells at \$ 125. **IF THE RETAILER SELLS THE SUIT THE PROFIT IS \$ 30. IF THE SUIT DOES NOT SELL THE LOSS IS \$95 or what he can get from the discount bin.**



**Profit \$ 30**



Cost Pr	Sell Pr
\$ 35	\$ 50

**Profit \$15**

Cost Pr	Sell Pr
\$ 50	\$ 70

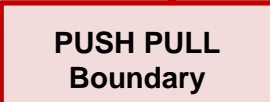
**Profit \$20**

Cost Pr	Sell Pr
\$ 70	\$ 95

**Profit \$25**

Cost Pr	Sell Pr
\$ 95	\$ 125

**No sale**



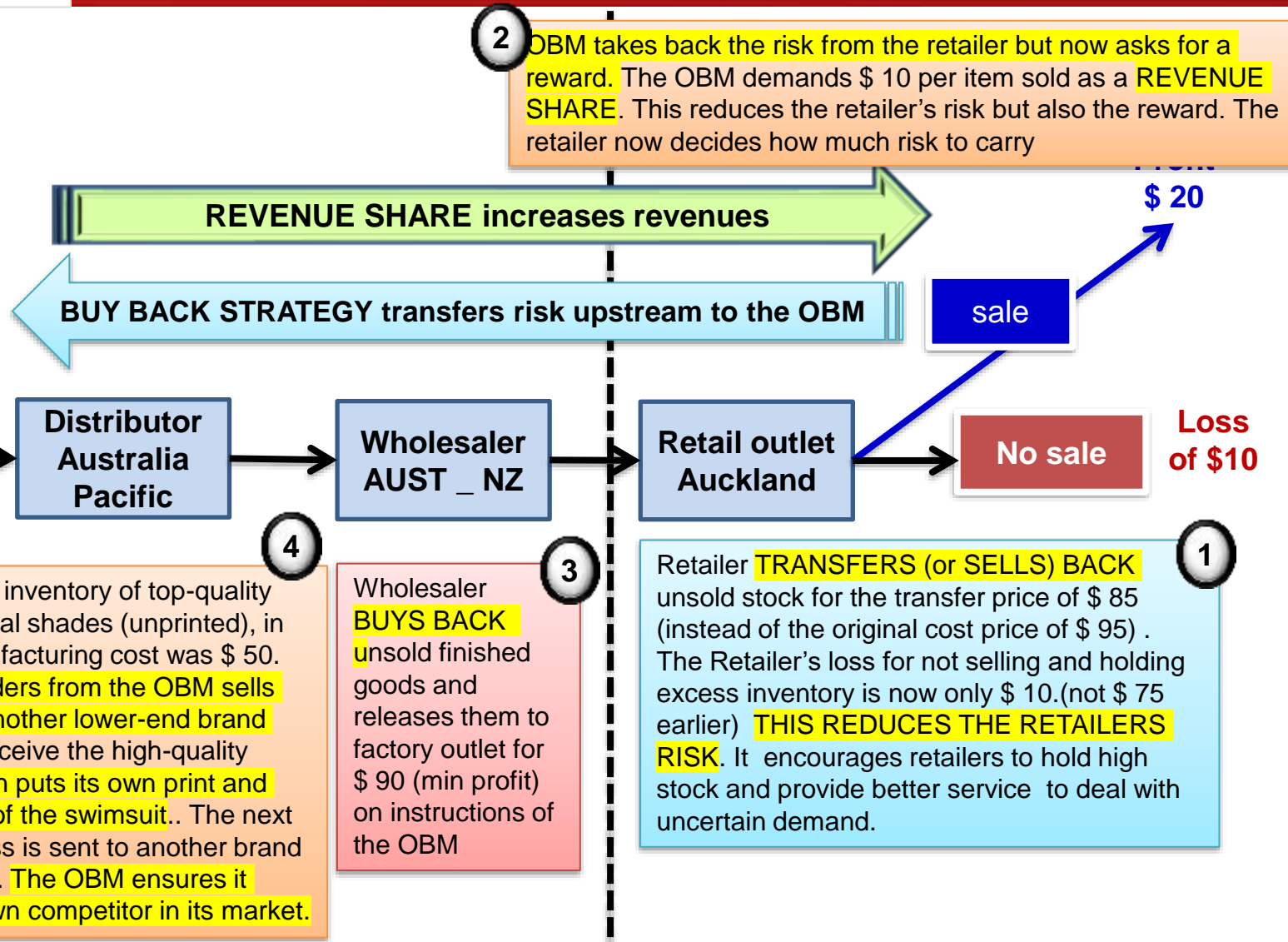
**Loss of (\$75)**

**The Retailer has no interest in holding excess inventory as the loss for not selling a suit and holding extra stock (\$ 75 per suit) is more than double the profit (\$ 30) the retailer would make for selling an swimsuit.**

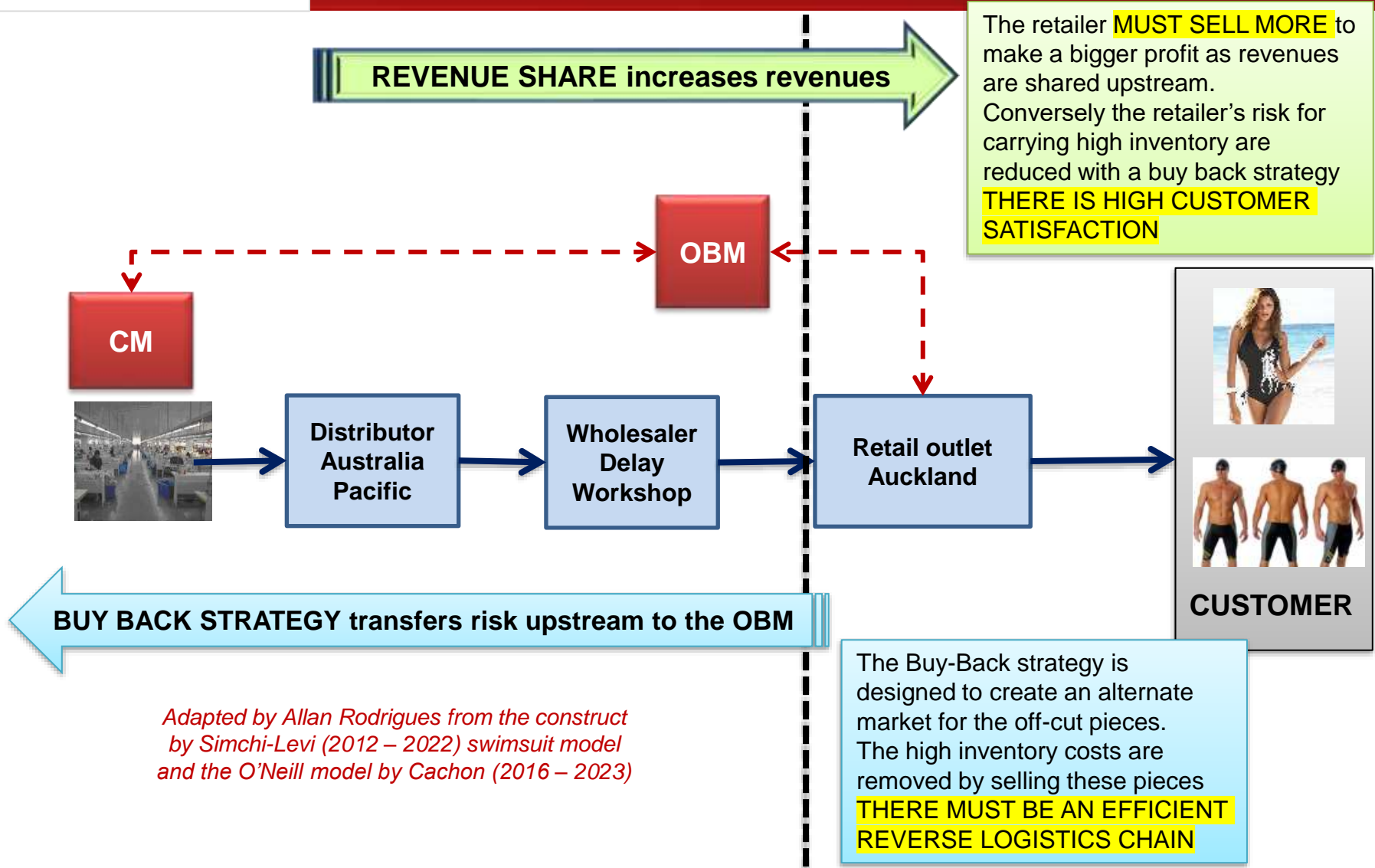
**BUT WITHOUT THAT EXTRA STOCK THE RETAILER CANNOT BE AGILE AND RAMP UP SUPPLY IF THE DEMAND SUDDENLY INCREASES**

# CASE 5 & 6 The conflict is resolved through Global Optimisation

OBM reduces the risk downstream with a buy back from the retailer  
OBM asks for a revenue share for buying back the risk



# CASE 5 & 6 The Fashion Industry 'Delay Manufacturing + Global Optimisation' Construct



# Global Optimisation

## Manage time – Manage Uncertainty

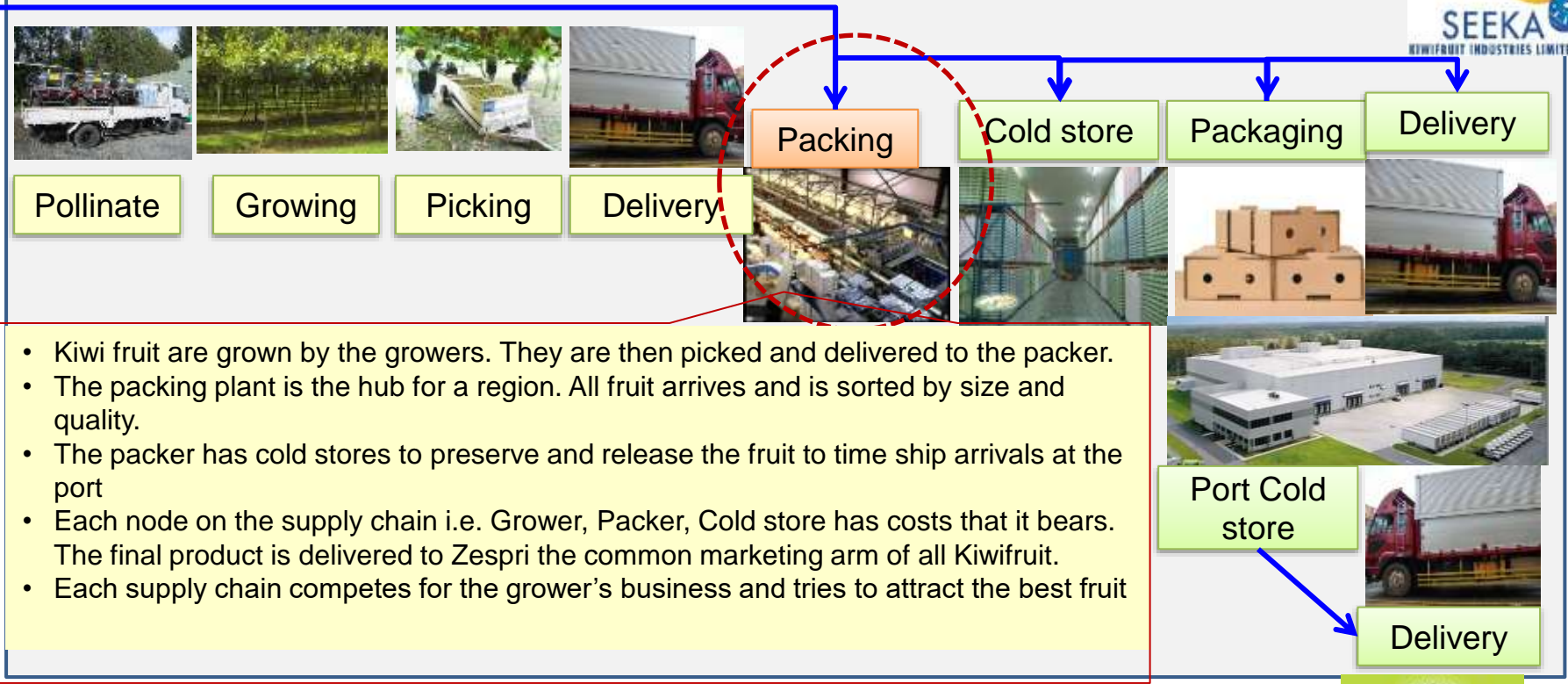


**On a Global Supply Chain “Time” Connects the parts  
If you Manage time – You can Manage volatility/Uncertainty**



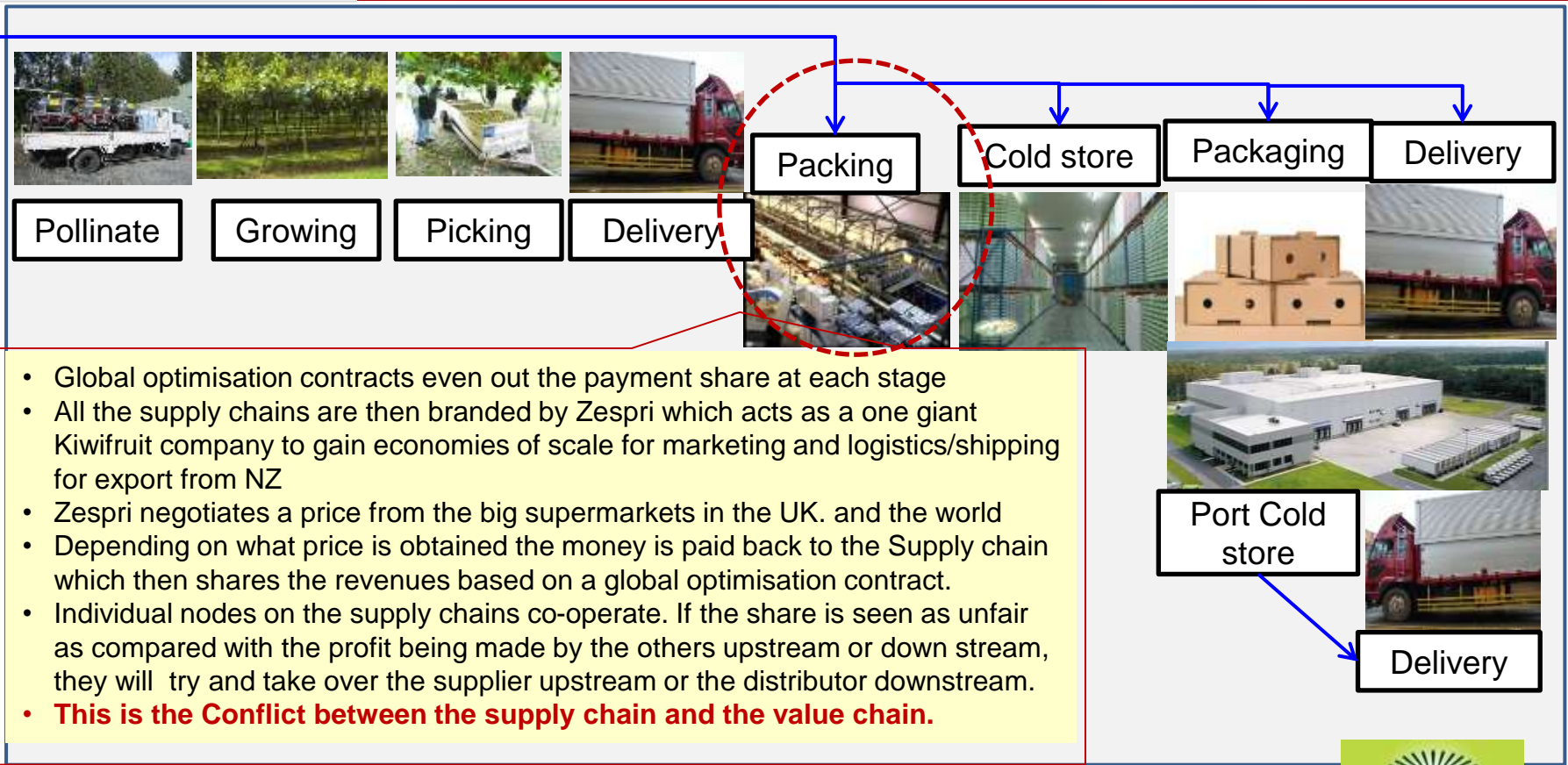


# CASE 7 The Global Supply Chain for a typical large Kiwi Fruit producer exporting to major retailer



- Kiwi fruit are grown by the growers. They are then picked and delivered to the packer.
- The packing plant is the hub for a region. All fruit arrives and is sorted by size and quality.
- The packer has cold stores to preserve and release the fruit to time ship arrivals at the port
- Each node on the supply chain i.e. Grower, Packer, Cold store has costs that it bears. The final product is delivered to Zespri the common marketing arm of all Kiwifruit.
- Each supply chain competes for the grower's business and tries to attract the best fruit



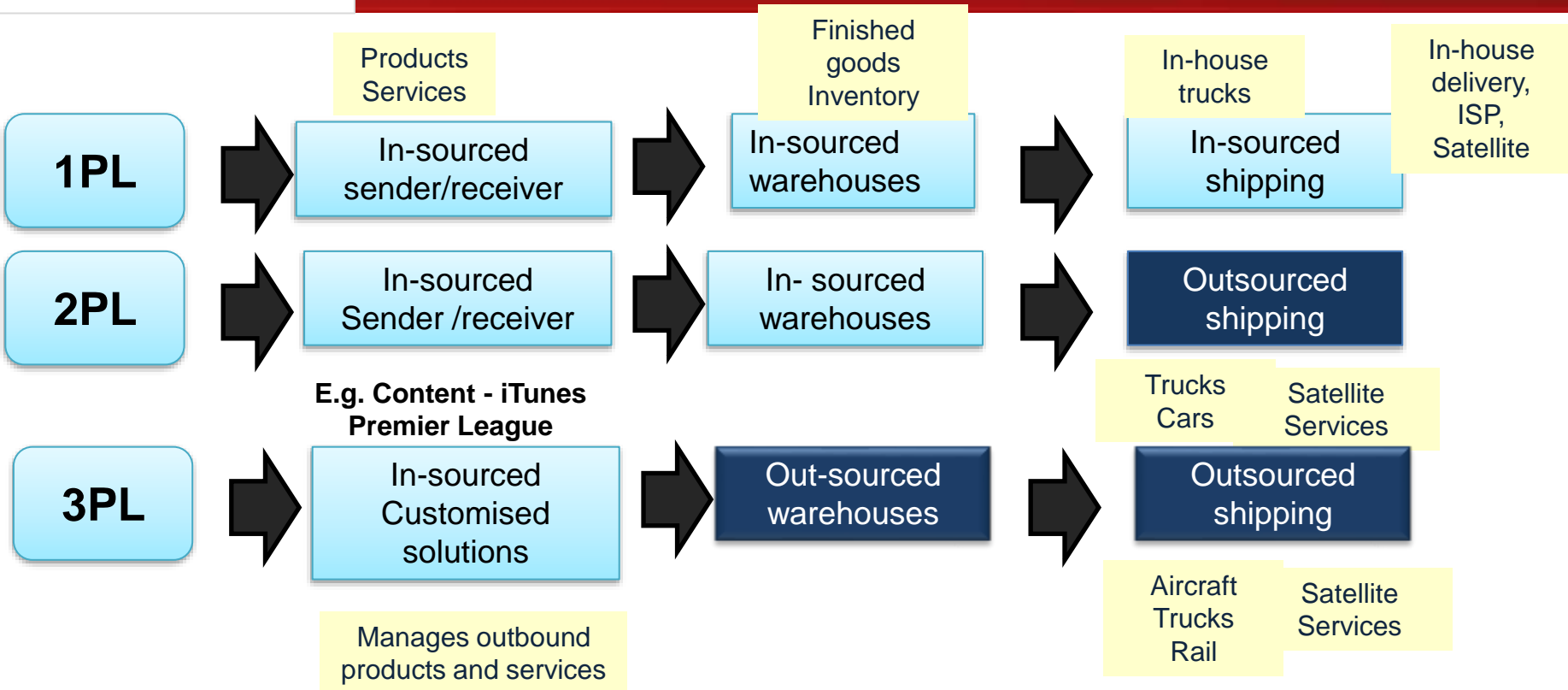


- Global optimisation contracts even out the payment share at each stage
- All the supply chains are then branded by Zespri which acts as a one giant Kiwifruit company to gain economies of scale for marketing and logistics/shipping for export from NZ
- Zespri negotiates a price from the big supermarkets in the UK. and the world
- Depending on what price is obtained the money is paid back to the Supply chain which then shares the revenues based on a global optimisation contract.
- Individual nodes on the supply chains co-operate. If the share is seen as unfair as compared with the profit being made by the others upstream or down stream, they will try and take over the supplier upstream or the distributor downstream.
- **This is the Conflict between the supply chain and the value chain.**

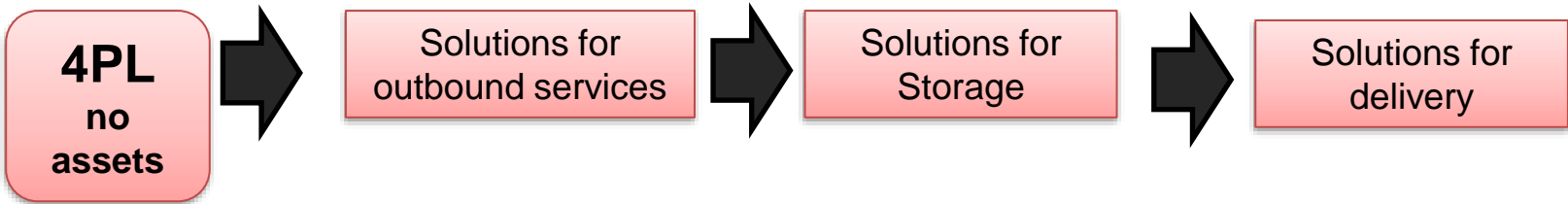
Sup-market UK	Delivery UK	Cold store UK

# Lean Agile GSCs

## Use 3<sup>rd</sup> and 4<sup>th</sup> party Logistics Providers

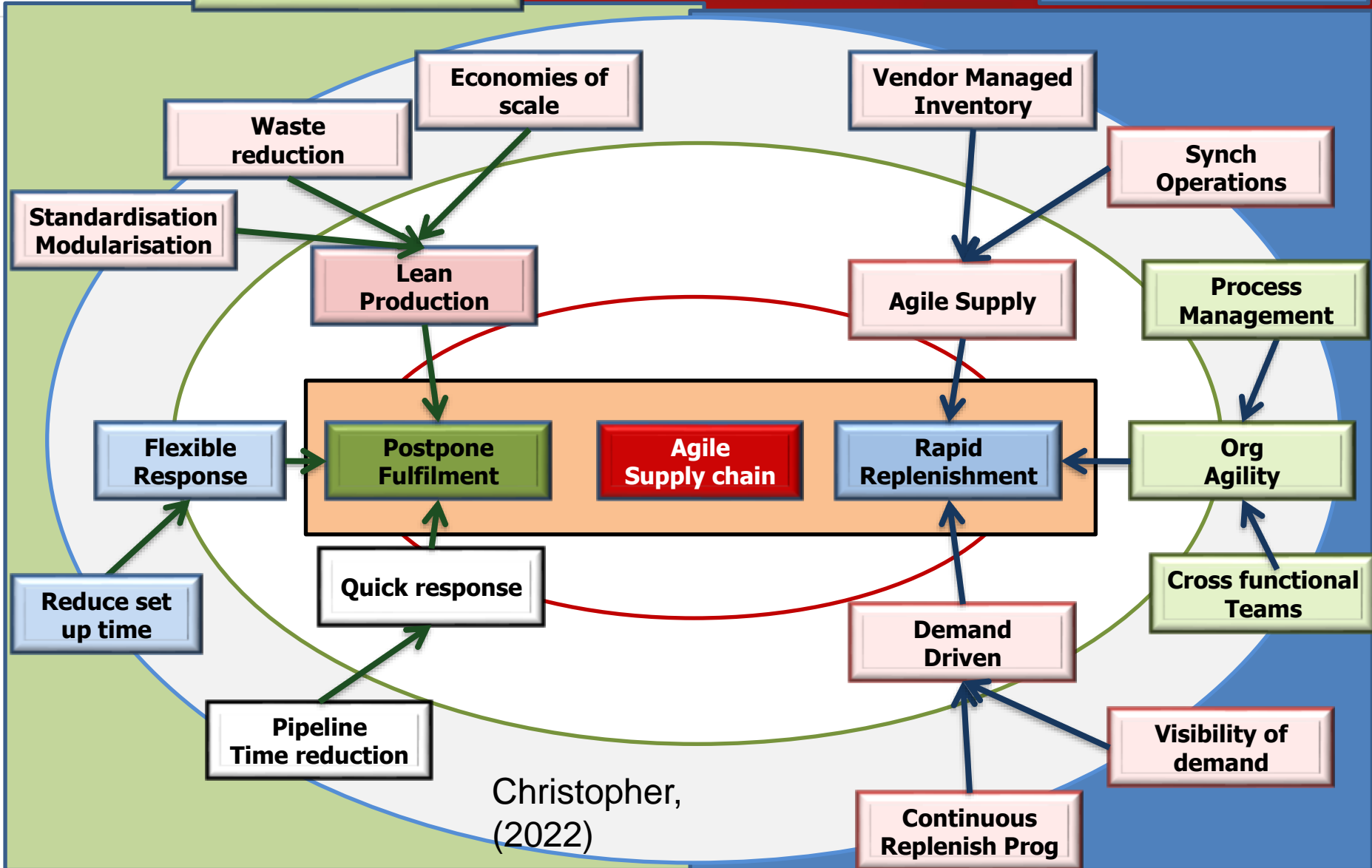


4PL is a consultancy not a provider



## AGILE MANUFACTURING

## AGILE DISTRIBUTION



Christopher,  
(2022)

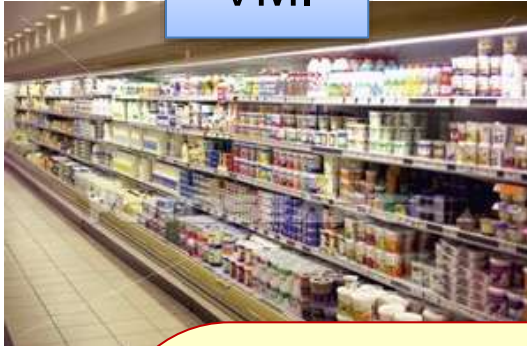
# 3 PLs use different strategies on the same transport run

VMI

Continuous Replacement' Logistics

CRL

3PL



Continuous Replacement' Logistics

3PL Contract logistics

- ❑ Supermarkets do not sell products. They sell real estate (Shelf space)
- ❑ They guarantee FOOT TRAFFIC by selecting the right locality and selling their brand to walk-in customers
- ❑ The suppliers bid for shelf space at auction. The more attractive the space (e.g. the right eyeline location of the shelf) the more the suppliers pay
- ❑ The suppliers then stock their own shelves. The supermarket charges a small fee for the checkout service and sends a continuous sales report to the supplier who then arranges supply through a 3PL in a CRL run
- ❑ THE INVENTORY CONTINUES TO BE OWNED BY THE SUPPLIER NOT THE SUPERMARKET IN MOST CASES

When the Supermarket chain builds a monopoly of loyal customers. it launches its own in-house brands and displaces the supplier.

**THIS IS THE CONFLICT BETWEEN THE SUPPLY CHAIN AND THE STRATEGIC VALUE CHAIN**

Modularity and Standardisation  
Reduces cost and lead time



Mazda 2



Mazda 3 – SP 25



Mazda 6 GLX



Mazda CX 5

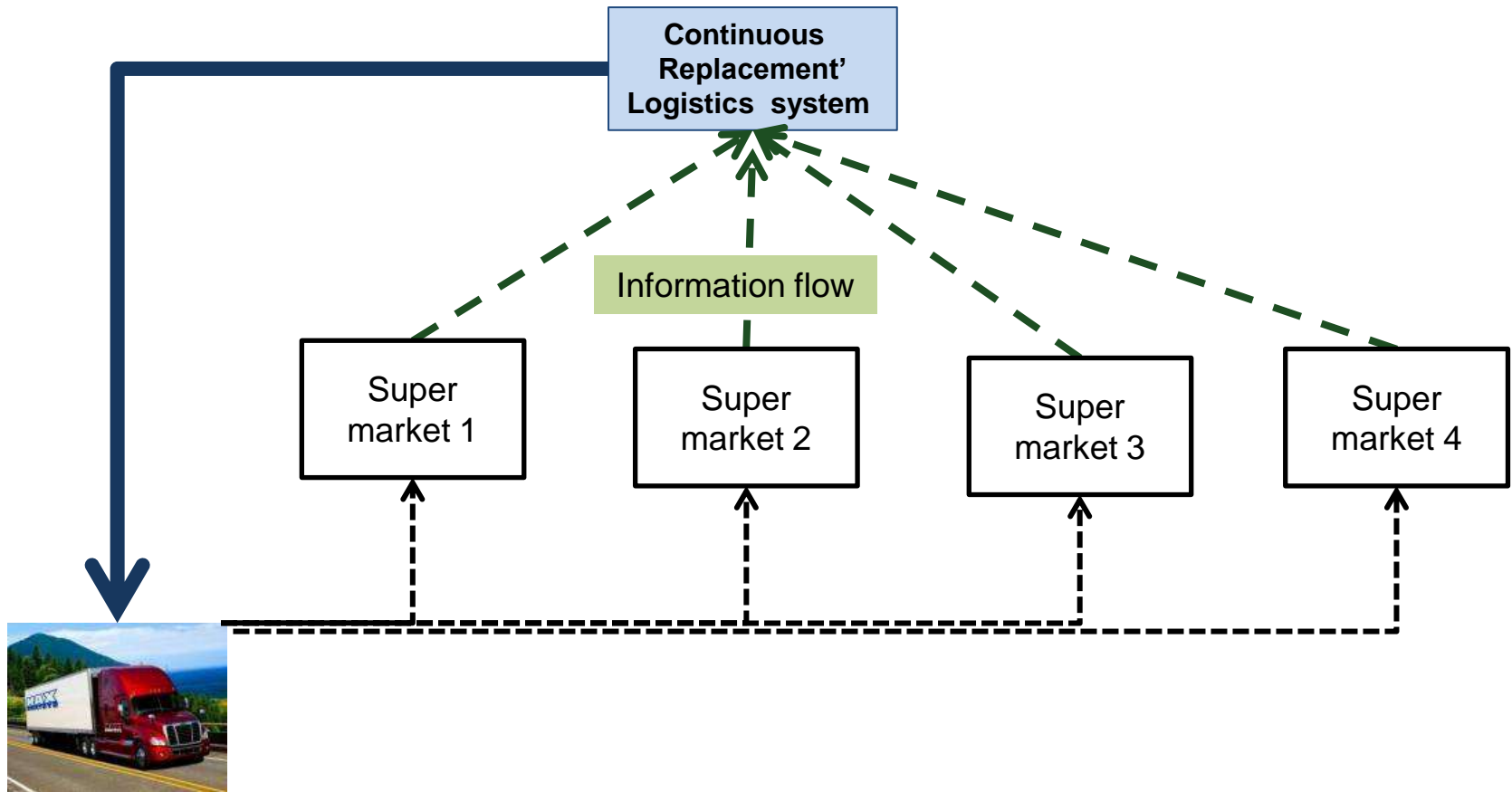


Mazda CX 9

It is not the 'parts' of the cheapest model that are standardised for all other models. The key is to build the top end model first and then standardise and modularise these high-quality parts into the low-end models to improve quality all round and to obtain economies of scale for the high end

The real innovation is economies of scope achieved  
When the fixed cost of different products are spread in  
ways that provide economies to the same provider.

# Continuous replenishment logistics Pipeline reduction



Temp Controlled Delivery

# A reverse approach is The consolidation warehouse

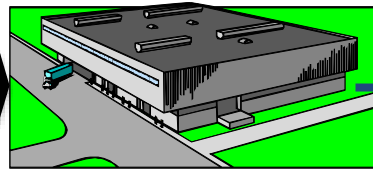
Plant A



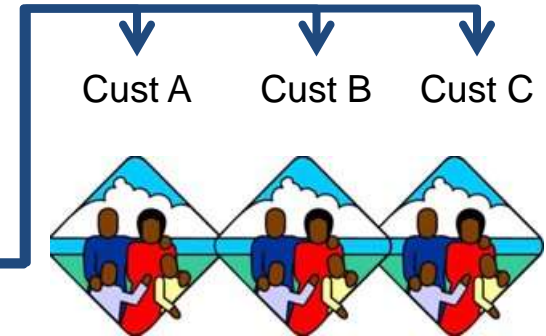
Plant B



Plant C



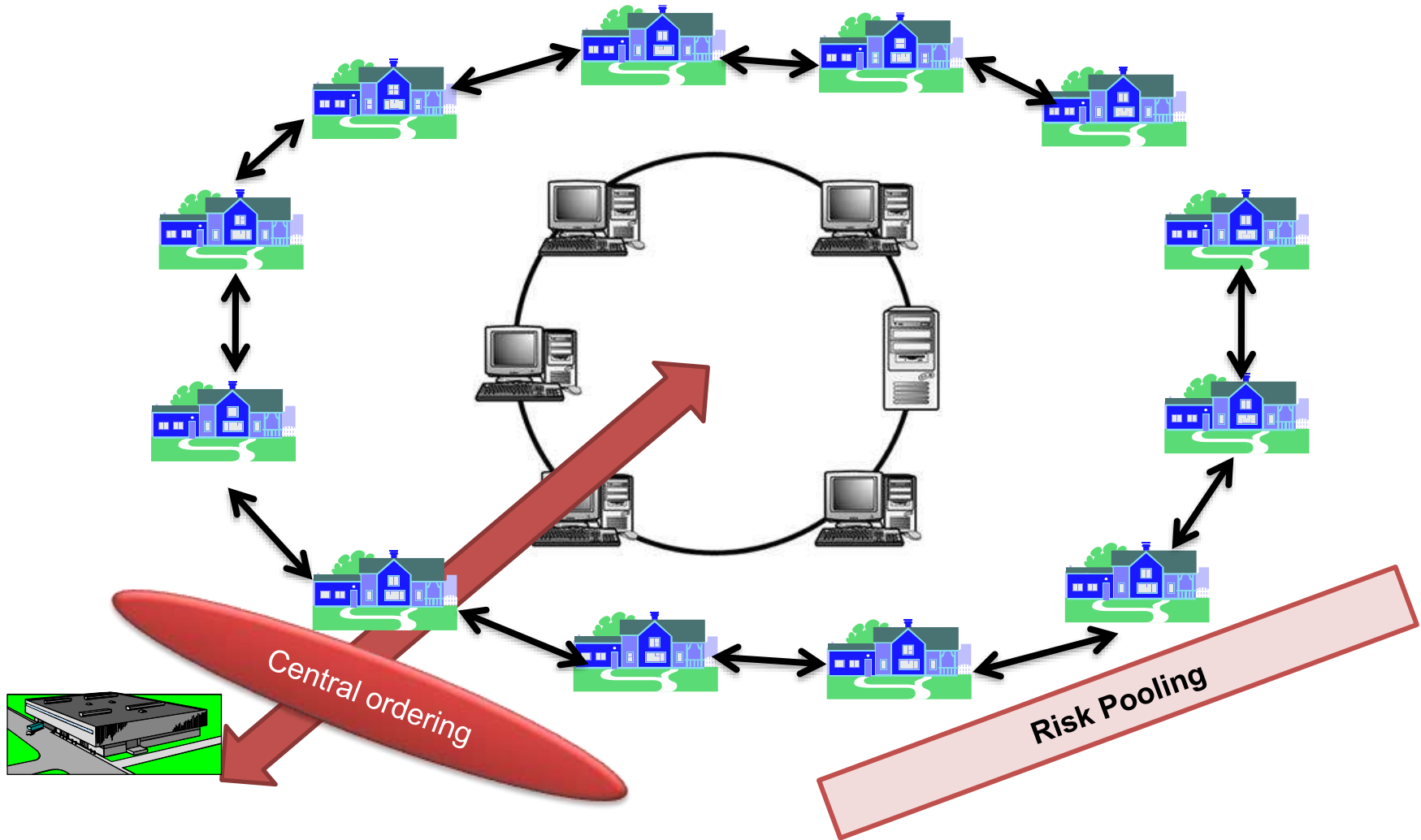
Consolidation Warehouse



Cross Docking example in reverse



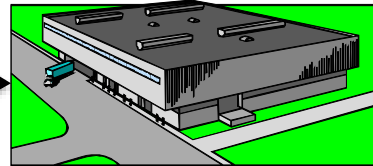
# The central retail risk pool risk spread reduces safety stock



# Break Bulk warehouses

Delay fulfilment  
Breaking bulk only takes place at the last possible moment and downstream near the customer

**Plant A**



**Break bulk Warehouses**

**Cust A**



**Cust B**



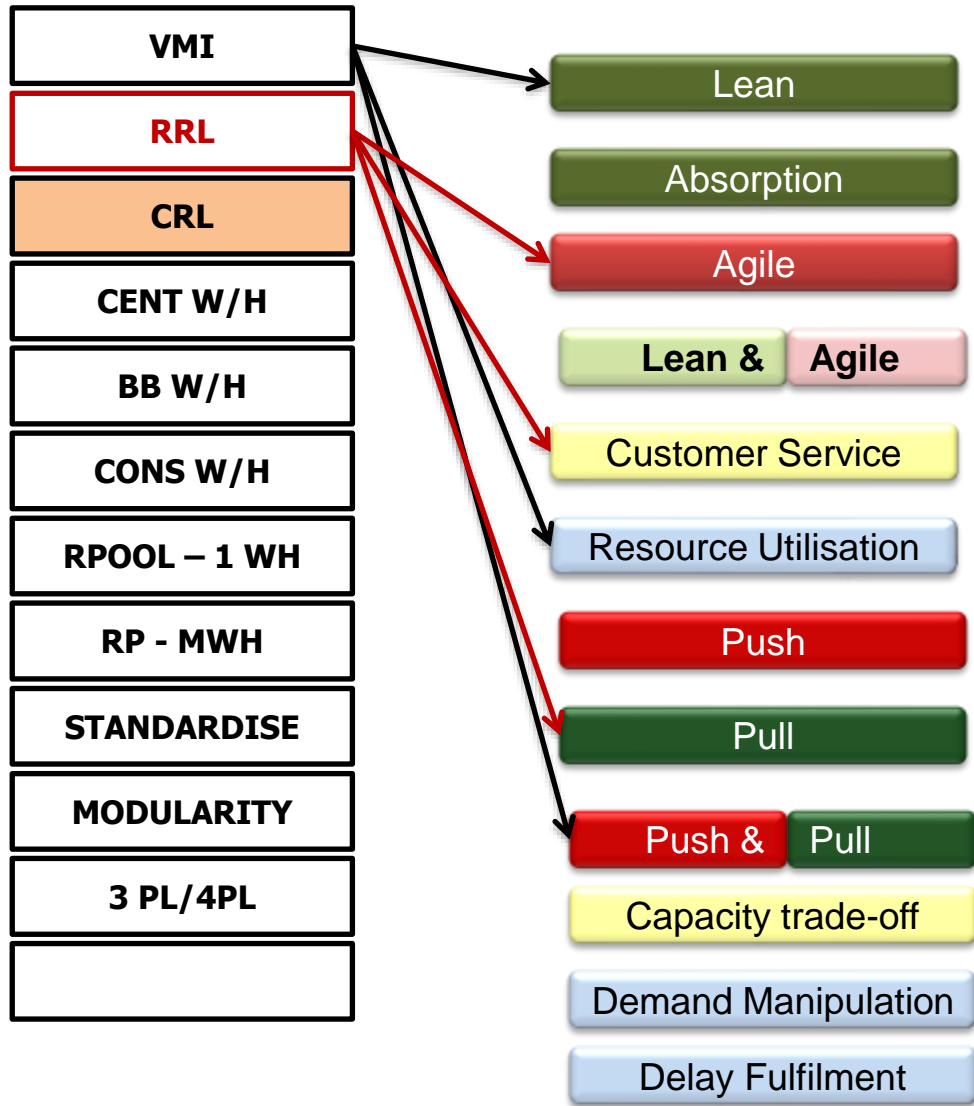
**Cust C**



# Mapping the Lean Agile GSC

## Accessorise Ops Strategy with Innovatory Tools

**VMI**  
**RRL**  
**CRL**  
**GLOBAL OPTIMISATION**  
**CENTRALISED WAREHOUSE**  
**BREAK BULK WAREHOUSE**  
**CONSOLIDATION WAREHOUSE**  
  
**RISK POOLING**  
 - Two warehouses  
 - Multiple warehouses  
 - Optimum warehouses  
  
**STANDARDISATION**  
**MODULARITY**  
  
**INFORMATION SHARING**  
 - Co-opetition  
**ELECTRONIC DATA DELIVERY**  
**SATELLITE UPLINKING**  
**RFID TRACKING**  
  
**1PL, 2PL, 3PL, 4PL LOGISTICS**



1. Lean
2. Agile
3. Lean and Agile
4. CS or RU
5. Push
6. Pull
7. Push and Pull
8. Capacity trade-off
9. Demand Manipulated
10. Delay Manufacturing

# Introduction to Presentation 3

## The Strategic Value Chain

### MANAGING THE CONFLICTS BETWEEN THE GLOBAL SUPPLY CHAIN & THE STRATEGIC VALUE CHAIN



Somewhere on the supply chain is usually an **alpha male** who dominates it and often will not easily listen to reason

The Strategic Value Chain is a subset of whoever has the dominant competitive advantage in the market

Left unaddressed the Supply Chain becomes a subset of the Strategic Value Chain unless value along the supply chain is globally optimised.



MANAGING THE CONFLICT ON THE  
GSC- SVC BOUNDARY

Presentation Part 3 Follows