Brief historical notes on the concepts of **supply chain management** and **supply chain strategy**

CLI 6th Academic Workshop

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Part 1

NOTES ON THE CONCEPT OF SUPPLY CHAIN MANAGEMENT

At the beginning, there was ***an intuition***…

"The concept of SCM was mentioned in business literature as early as Forrester (1961), who suggested that the success of industrial companies hinged on the 'interactions between flows of information, materials, manpower and capital equipment' ."

Giunipero, *et al.* (2008)

…followed by early ***innitiatives***

*"The early beginnings of supply chain management can be traced to the textile industry with the Quick Response program (**a partnership where retailers and suppliers work together to respond more quickly to consumer needs by sharing information**) and later to Efficient Consumer Response in the grocery industry"*

Lummus, *et al.* (2001)

The ***names*** appeared in the 80's

"The term 'supply chain management' is relatively new in the literature, appearing first in 1982"

Cooper, *et al.* (1997)

"the term SCM first appeared in the literature more than twenty years ago (Oliver and Webber, 1982)"

Gibson, *et al.* (2005)

"only a handful of articles mentioned the phrase 'supply chain' between 1985 and 1997."

Giunipero, *et al.* (2008)

The ***field*** grew in the (late) 1990's

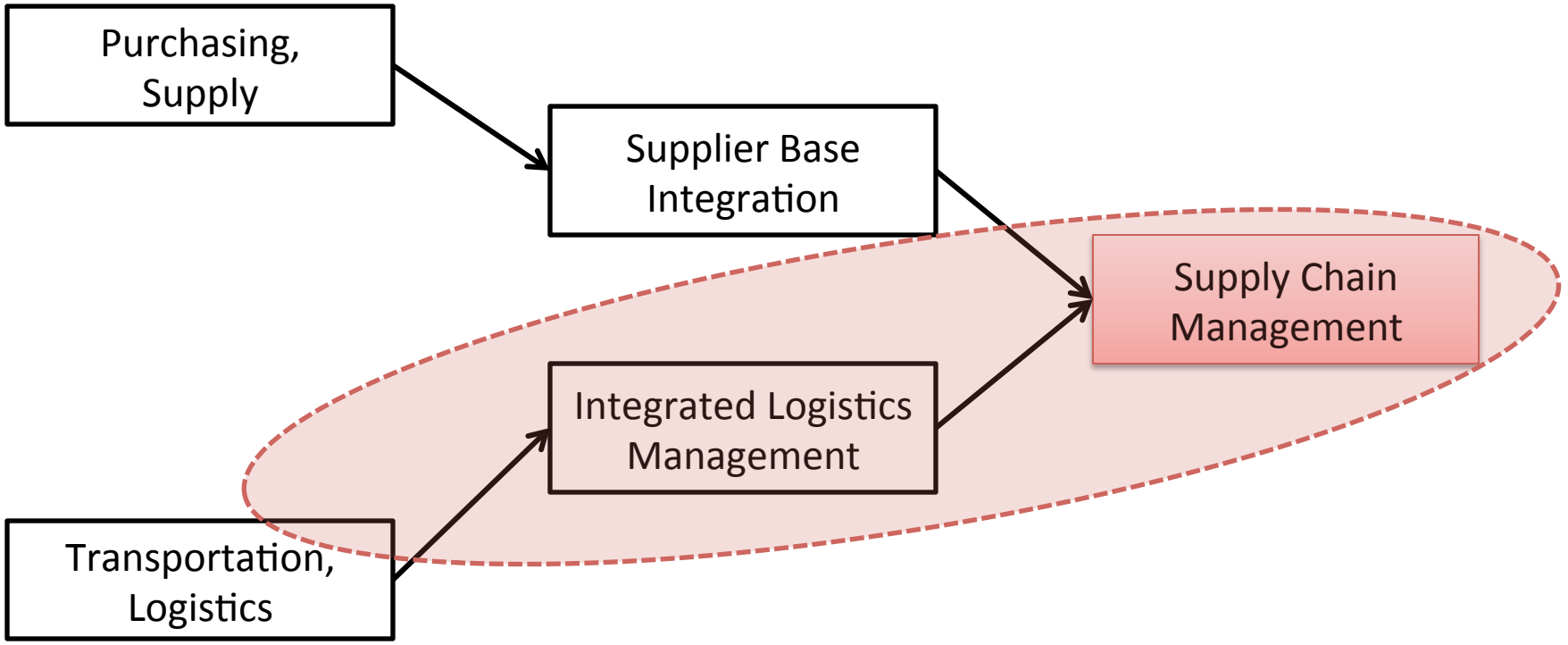
"About 1990, academics first described SCM from a theoretical standpoint to clarify the difference from more traditional approaches"

Cooper, *et al.* (1997)

"the diffusion of the field did not take place until the late 1990s, with most of the theoretical and empirical investigation commencing in 1997"

Giunipero, *et al.* (2008)

Whence, SCM?



1970s 1980s 1990s 2000s

Adapted from: Tan (2000)

Saying just 'logistics' was ***not enough***

'**Modern** logistics', as defined in Bowersox 1978, is "the process of strategically managing the movement and storage of materials, parts, and finished inventory from suppliers, between enterprise facilities and to customers".

'**Business** logistics',

'**Integrated** logistics',

The definition of ***logistics*** was expanded…

- *"the management of all inbound and outbound materials, parts, supplies and finished goods"*
- *"the integrated management of purchasing, transportation, and storage on a functional basis"*
- *"the management of the pre-production, in-production and post-production channels"*

Calvinato (1982)

"In a true business context … this definition ***expands*** *logistics beyond merely physical distribution"*

Lummus, et al. (2001)

‘Official’ definitions were also ***revised***

“The 1986 CLM definition of logistics has been augmented to include services along with goods and information movement.

In addition to conforming to customer requirements,

others view the output of the logistics process as creating value for the ultimate customer (1992)

and contributing to current and future profitability of the firm (1994).”

Cooper, *et al.* (**1997**)

Redefinition brought some ***confusion*** around the turn of the 20th century

*"it is **unclear** what specific characteristics **differentiate** the two disciplines … for many, the contemporary understanding of SCM is not appreciably different from the understanding of integrated logistics management"*

Cooper, *et al.* (**1997**)

*"The terms 'supply chain management' and 'logistics' are often **confused** and viewed as **overlapping**, depending on the definition used by an organization"*

Lummus, *et al.* (**2001**)

“a discipline in the early stages”

SCM “is a discipline in the early stages of evolution”

“Academics have attempted to provide some structure to SCM by re-examining previous SCM definitions and ***offering more complete*** SCM definitions that include scope, functions and relationships.”

“Bechtel and Jayaram (1997) classified more than **50 existing SCM definitions** into five schools of thought and identified functional and process areas covered.”

Gibson, et al. (2005)

Some ***consensus*** was needed

"The relevant question that we need to gain consensus on is whether SCM is simply new words for properly implemented logistics across organizations"

Cooper, *et al.* (**1997**)

"The discipline of supply chain management is going through a normal maturation process of ***reaching a consensus*** *agreement on what is included, and what is not included in the discipline"*

Gibson, *et al.* (**2005**)

There was discussion about what SCM ***is not***

"supply chain management is not:

- *inventory management*
- *logistics management*
- *supplier partnerships*
- *driven from the supply side*
- *a shipping strategy*
- *distribution management*
- *the logistics pipeline*
- *procurement management*
- *a computer system"* ***(!)***

Lummus and Vokurka (1999)

2003: Logistics as a "part of" SCM

In 1986, CLM defines logistics as "

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In 2003, CLM defines logistics

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requirements."

"This does not make one definition 'right' and the other 'wrong' – it merely means … a starting point for additional discussion by practitioners and academics in the discipline. Again, this is a normal evolutionary process"

Gibson, *et al.* (2005)

***2005*: from CLM to CSCMP**

"Effective January 1, 2005, the Council of Logistics Management (CLM) became the Council of Supply Chain Management Professionals (CSCMP)."

"This is more than a name change."

Larson, *et al.* (2007)

"a ***broader*** emphasis"

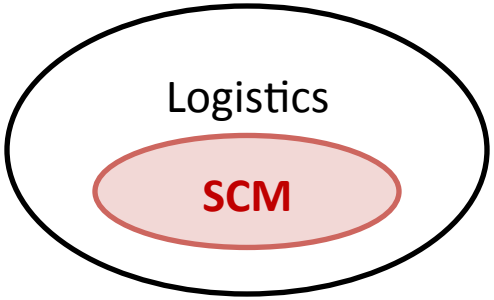
"Reflecting expanded roles … the Council is adopting 'a broader emphasis on the entire supply chain,' incorporating 'not only logistics but also procurement, manufacturing, operations, and sales/marketing functions'"

"CSCMP, and other professional associations, such as the Institute for Supply Management (ISM), have developed definitions of supply chain management and revised their missions accordingly"

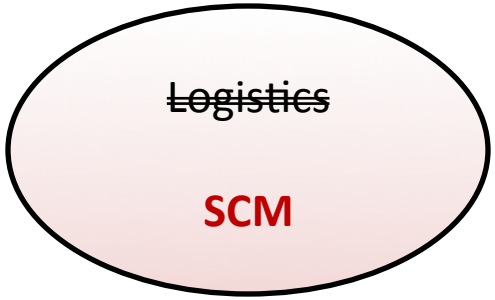
Larson, *et al.* (2007

Yet ***different perspectives*** remain

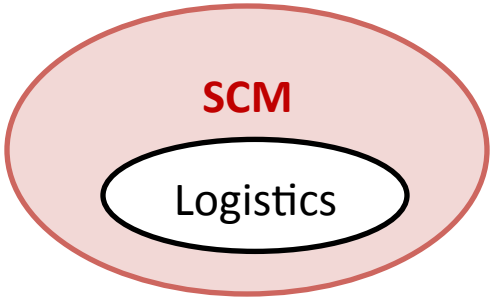
19% think that…



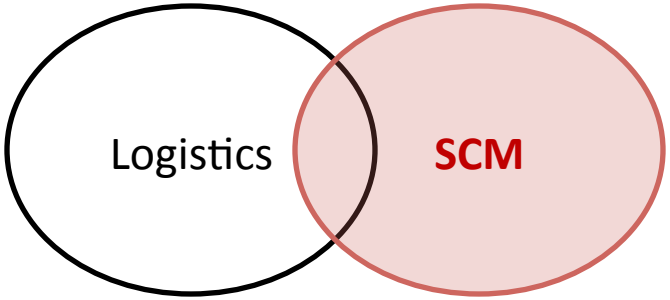
6% think that…



47% think that…



28% think that…



Adapted from: Larson, *et al.* (2007)

SO, WHAT IS
SUPPLY CHAIN MANAGEMENT?

Defining ***supply chain*** first

"a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer."

***Direct**: a company, a supplier and a customer*

***Extended**: + supplier's suppliers + customer's customers*

***Ultimate**: all entities upstream and downstream*

Mentzer, *et al.* (2001)

SCM as a ***management philosophy***

- a systems approach to viewing the supply chain as a whole
- a strategic orientation towards cooperative efforts to synchronize and converge intra- and inter-firm capabilities
- a customer focus, to create sources of customer value

Mentzer*, et al.* (2001)

'Supply Chain ***Orientation***'

Mentzer, *et al.* (2001), call this management philosophy a Supply Chain Orientation, and defines it as

"*the recognition by an organization of the systemic, strategic implications of the tactical activities involved in managing the various flows in a supply chain.*"

Mentzer, *et al.* (2001

SCM as a ***set of activities & processes***

To adopt a supply chain management philosophy, the firm must establish management practices consistent with it. Including: (1) integrated behavior, (2) mutual sharing of information, (3) mutual sharing of risks and rewards, (4) cooperation, (5) shared goals and focus on customer service, (6) integration of processes, (7) partnerships in long-term relationships.

Mentzer, *et al.* (2001)

‘Supply Chain ***Management***’

Mentzer*, et al.* (2001 equate supply chain management with

“*the sum total of all the overt management actions undertaken to realize the SCO philosophy.*”

Mentzer*, et al.* (2001

Defining ***supply chain management***

the systemic, strategic coordination of
the traditional business functions and
the tactics across these business functions
within a particular company and
across businesses within the supply chain,
for the purposes of improving the long-term performance of the individual companies
and the supply chain as a whole

Mentzer, *et al.* (2001)

SCM's ***functional scope***

In Mentzer's model of supply chain management, the following traditional business functions are included:

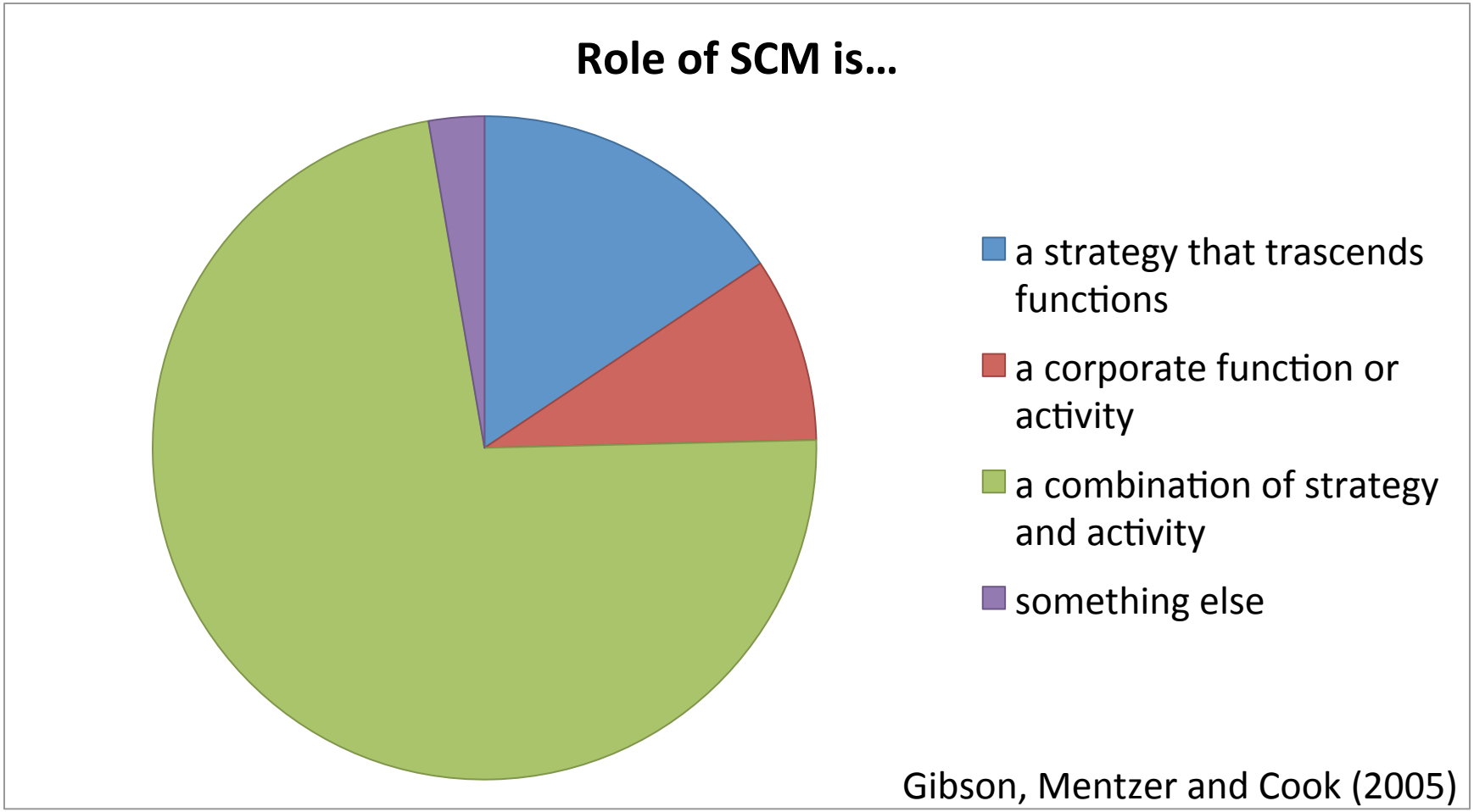
- *Marketing*
- *Sales*
- *R & D*
- *Forecasting*
- *Production*
- *Purchasing*
- *Logistics*
- *Information Systems*
- *Finance*
- *Customer Service*

Mentzer, *et al.* (2001)

Part 2

ON SOME EARLY IDEAS ABOUT SUPPLY CHAIN STRATEGY

Primary role of SCM within an organization is a combination of **strategy** and **activity**



The '*two faces*' of the discipline

Shapiro and Heskett (1985) state that "Logistics management is characterized by a difficult, yet fundamental dichotomy."

Tactical		***Strategic***
Short term oriented	VS	*Long term oriented*
Detailed		*Broad*
Quantitative		*Qualitative*

"most important role is **strategic**"

"Logistics … at one and the same time … requires a long-term perspective and strategic planning as well as … day-to-day work"

"Logistics' most important role is strategic."

Recognize "potential of a well-designed and effectively managed logistics system to advance a company's strategic goals"

"The successful firm uses logistics as part of its competitive arsenal"

Shapiro and Heskett (1985)

Supply chain strategy is an ***elusive*** subject

- Often 'high-level discussions of supply chain strategy are completely void of facts' (Hicks, 1999)
- Often firms have 'no coherent supply chain strategy' in place (Hammant et al, 1999)
- Most firms (3 out of 5) report not having a 'well defined' supply chain strategy in place (Harrison and New, 2002)
- 'Many questions remain unanswered about how best to characterize supply chain strategies (Frolich and Westbrook 2001)

THE ARTICLE THAT LAUNCHED A THOUSAND* PAPERS: FISHER 1997

* 1772 CITES IN GOOGLE SCHOLAR AS OF TODAY

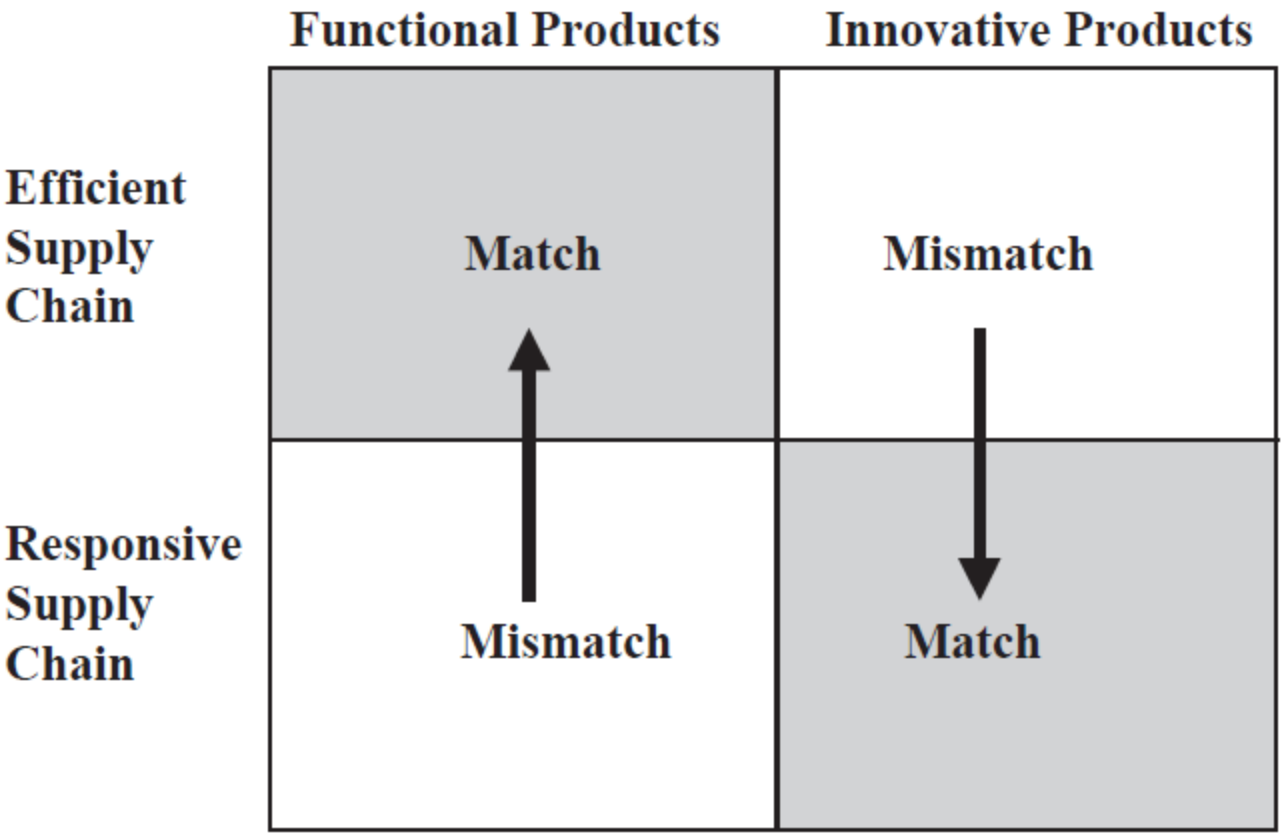
Main idea:

Match supply chain type to demand type

"The root cause of problems plaguing many supply chains is a **mismatch** between the type of product and the type of supply chain."

"The first step in devising an effective supply chain strategy is … to consider the nature of the **demand** for the products"

Fisher (1997)'s Matrix



What data supports Fisher's (1997)?

"From my ten years of research and consulting on supply chain issues ... I have been able to devise such a framework."

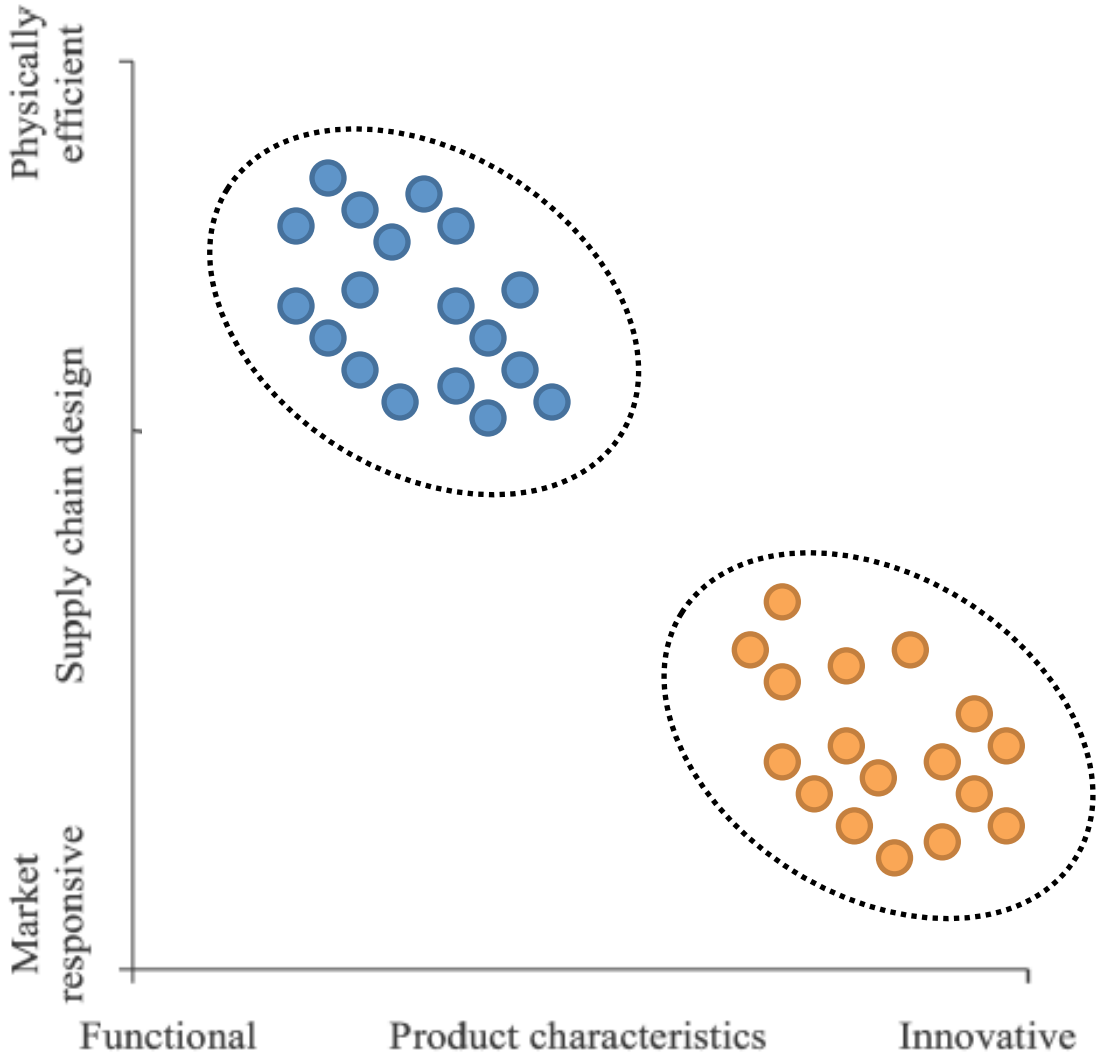
AN ATTEMPT TO EMPIRICALLY VALIDATE FISHER (1997) : SELLDIN AND OLHAGER (2007)

Relationship between product types and supply-chain types

The claim from Selldin and Olhanger (2007):

*"Significant **relationships are found** between product types and supply chain types, as well as concerning the impact of alignment on performance."*

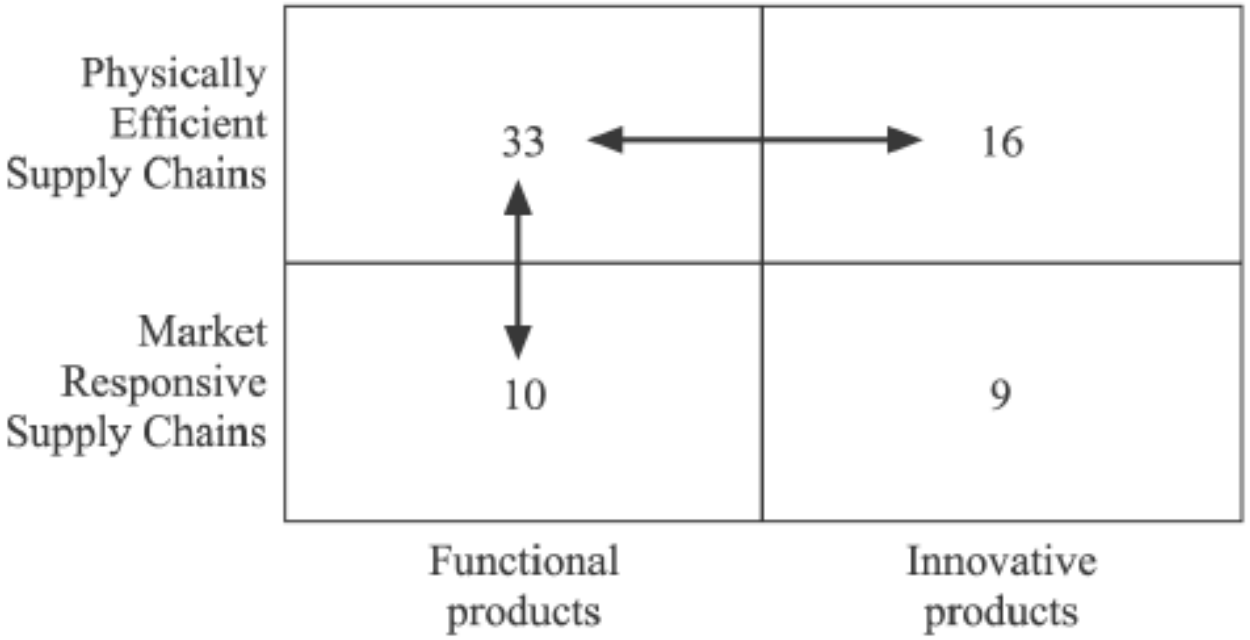
Figure 2 Scatter diagram of the product type versus supply chain design



Note: The regression line (non-significant) indicates the level of adherence to the assumed fit between product and supply chain type

Source:
Selldin and Olhanger (2007)

Figure 3 The distribution of respondents in the four quadrants, with significant relationships (at the 0.01 level)



Source: Selldin and Olhanger (2007)

Link between match and performance

"Selldin and Olhager (2007) found support for the matrix proposed by Fisher (1997) in that companies where product characteristics and supply chain strategy were well matched **outperformed** companies with poor match."

(Qi, Boyer and Zhao, 2009)

H2d. Companies with matches between products and supply chain perform better on delivery dependability.

Partially Supported

H2b. There is no performance difference in terms of product quality.

Cannot be rejected

H2a. Companies with functional products in physically efficient supply chains perform better on cost.

Not supported

H2c. Companies with innovative products in market-responsive supply chains perform better on delivery speed and flexibility.

Not supported

H2e. Companies with a match between product type and supply chain type have higher profitability than companies with a mismatch.

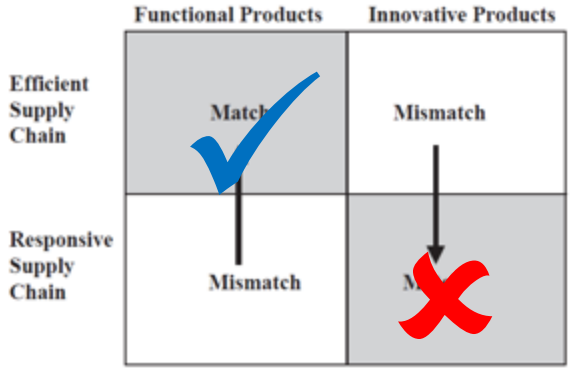
Not supported

Source: Selldin and Olhanger (2007)

So, what did Selldin and Olhanger (2007) verify empirically?

- "Empirical evidence **confirmed** the association between functional products and efficient supply chains."
- "However, the association between innovative products and responsive supply chains was **not supported**."
- "this testing of the model was incomplete."

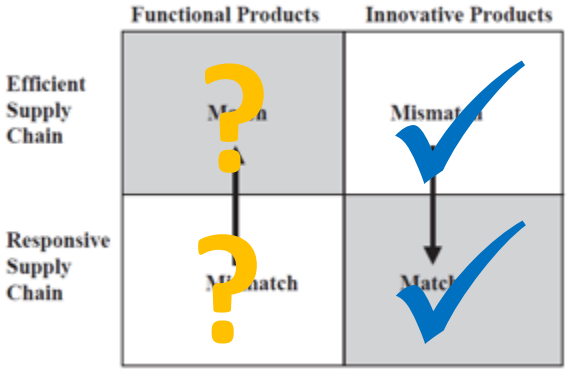
Source: Lo and Power (2010)



OTHER ATTEMPTS TO EMPIRICALLY VALIDATE FISHER (1997)

Qi, Boyer & Zhao (2009)

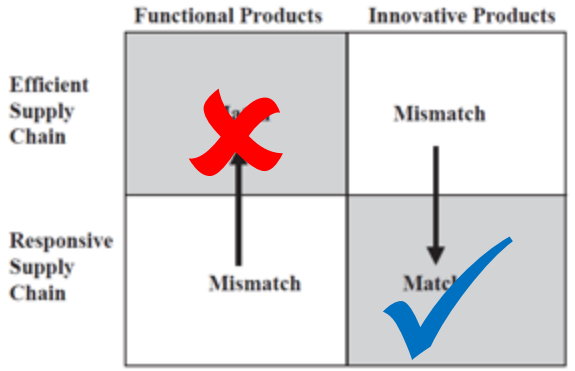
- "a lean strategy **is** associated with very low values for innovative products
- "an agile strategy **is** marked by much higher values for innovative products."
- "these results provide **support** for the product characteristics/supply chain strategy matrix"
- Really? What about the other half?



Li and O'Brien (2001)

Lo and Power (2010) review their findings:

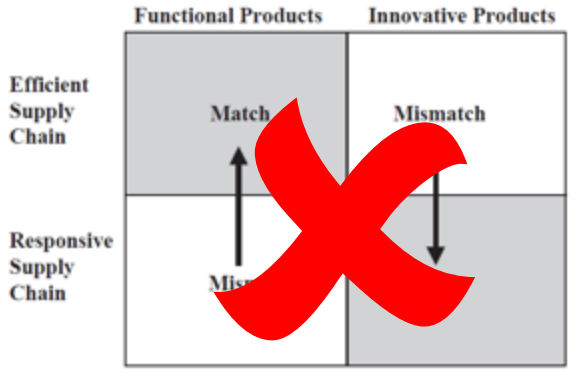
- **Confirmed** link between innovative products and responsive manufacturing,
- But could **not confirm** link between functional products and efficient manufacturing.



Lo and Power (2010)

- "The survey results indicate that the association between product nature and supply chain strategy is **not significant**."

- "it is argued that the association between product nature and supply chain strategy as proposed in Fisher's model **is not clear**."



A PROBLEM WITH FISHER'S MODEL:
REALITY IS MORE COMPLICATED

Products are not black or white…

- Lo and Power (2010) found that **78%** of respondents reported providing products with a **mix** of functional and innovative characteristics as defined by Fisher.

- "This finding serves to further support the concept of a '**hybrid product**', which is defined as consisting of [a] 'mix of standard and innovative components'"

…and neither are strategies…

- In Fisher's framework, efficient and responsive supply chain strategies are treated as being **mutually exclusive**: firms can choose only one.

- Lo and Power (2010) found that **69%** of surveyed companies reported pursuing "**both** efficiency and responsiveness as their supply chain strategy".

Selldin and Olhanger (2007)

some companies mix characteristics from the two different supply chain types, most likely trying to get the best of both worlds. This negates the prescription of Fisher (1997), i.e. that the categorization of products and supply chains as well as the choice combinations are of either-or character.

BUILDING ON SAND…

EXPANDING FISHER'S MATRIX

Lee (2002)

Supply Uncertainty	Demand Uncertainty: Low (Functional Products)	Demand Uncertainty: High (Innovative Products)
Low (Stable Process)	Grocery, basic apparel, food, oil and gas	Fashion apparel, computers, pop music
High (Evolving Process)	Hydro-electric power, some food produce	Telecom, high-end computers, semiconductor

Cigolini et al (2004)

- An evolution upon Fisher, including the dominant life cycle phase and the inherent structural complexity of the product.

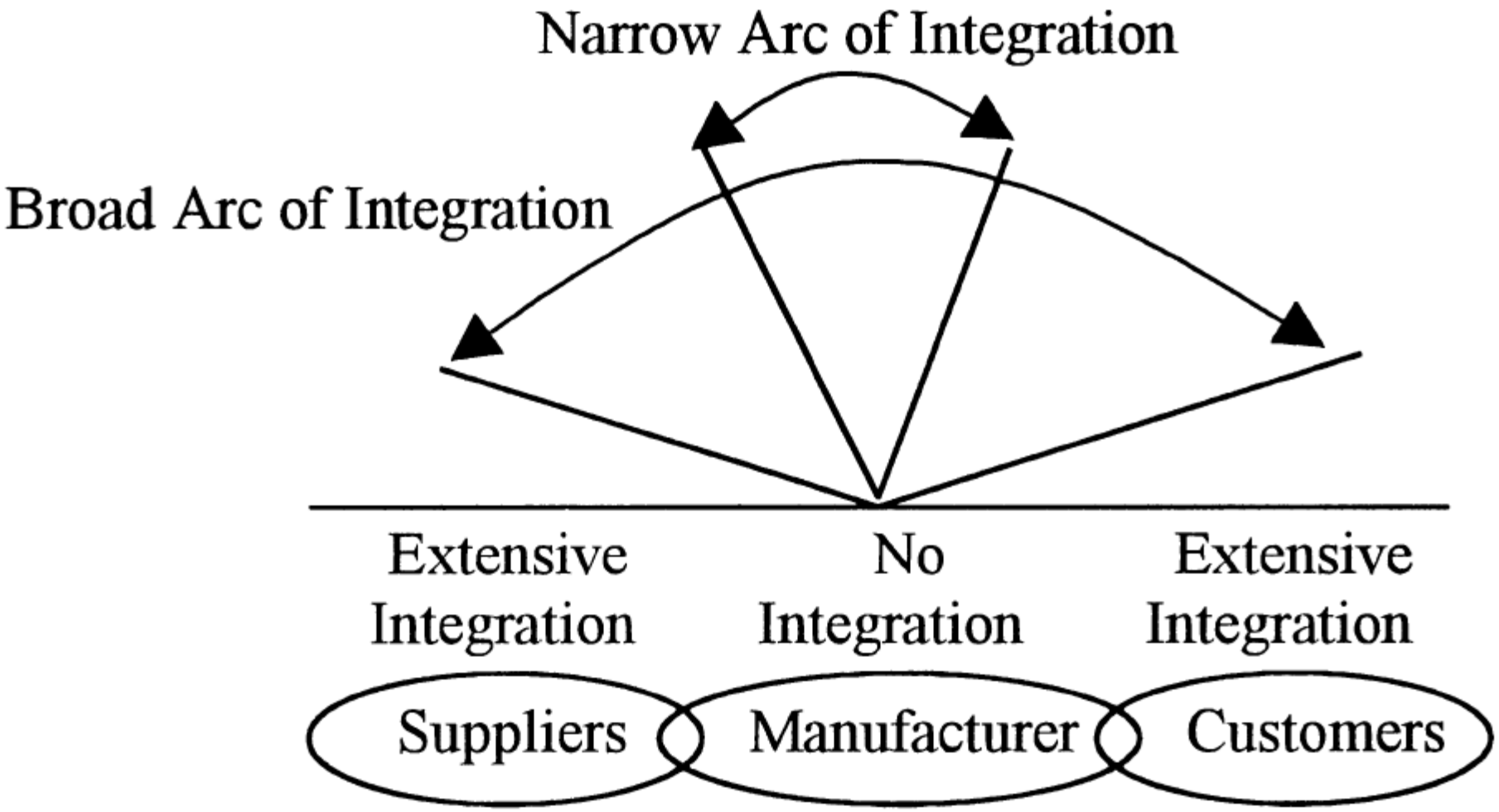
Supply chain type	Demand type: dominant product life cycle phase Introduction (and decline)	Growth	Maturity Complex products	Simple products
Efficient	A			C (grocery; pharmaceuticals; basic apparel, classical books)
Lean		E (computers)	D (white goods; automobiles)	
Quick	F (fashion apparel; book publishing, best selling books)			B

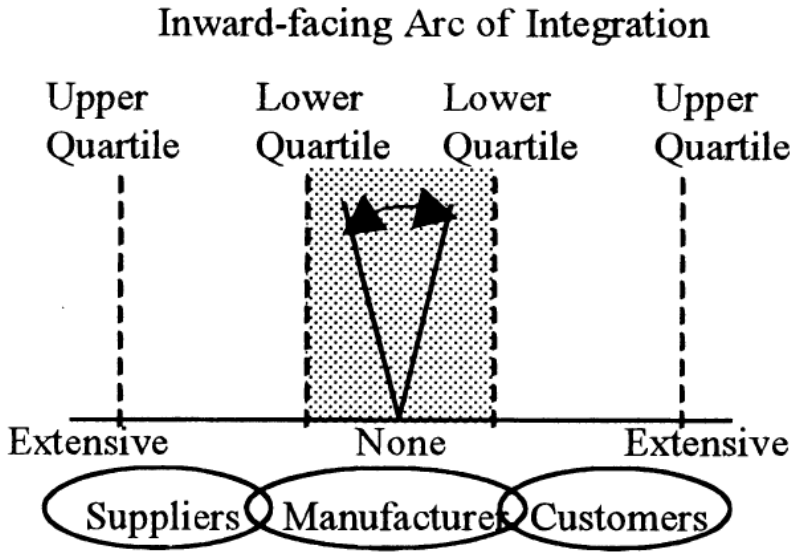
MOVING BEYOND FISHER… OTHER VOICES ON SUPPLY CHAIN STRATEGY

Frolich and Westbrook (2001)

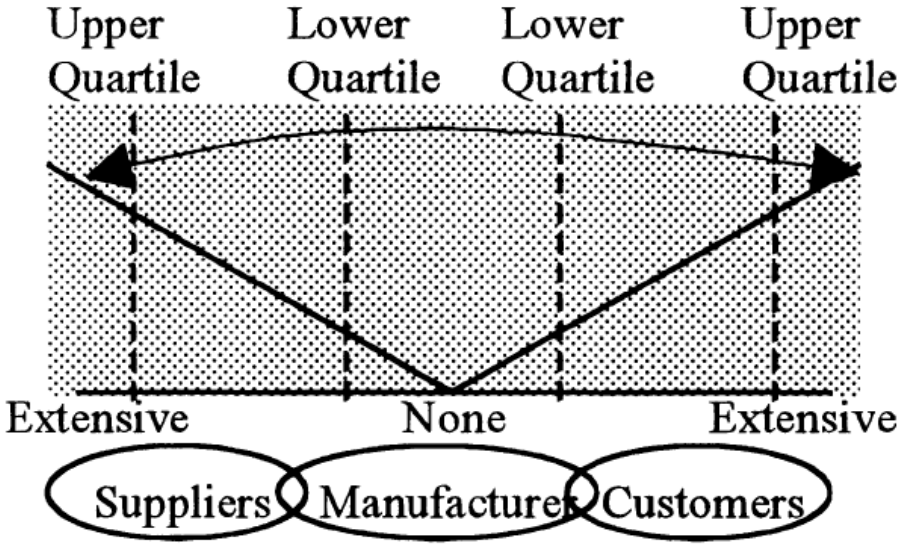
- ‘evidence suggested that there are **different** supply chain integration strategies that manufacturers followed.’
- ‘these different supply chain strategies can be empirically classified into at least five valid types, **defined by direction … and degree** of integration.’

Frolich and Westbrook (2001)





- 'inward-facing' manufacturers recorded some of the lowest performance improvement



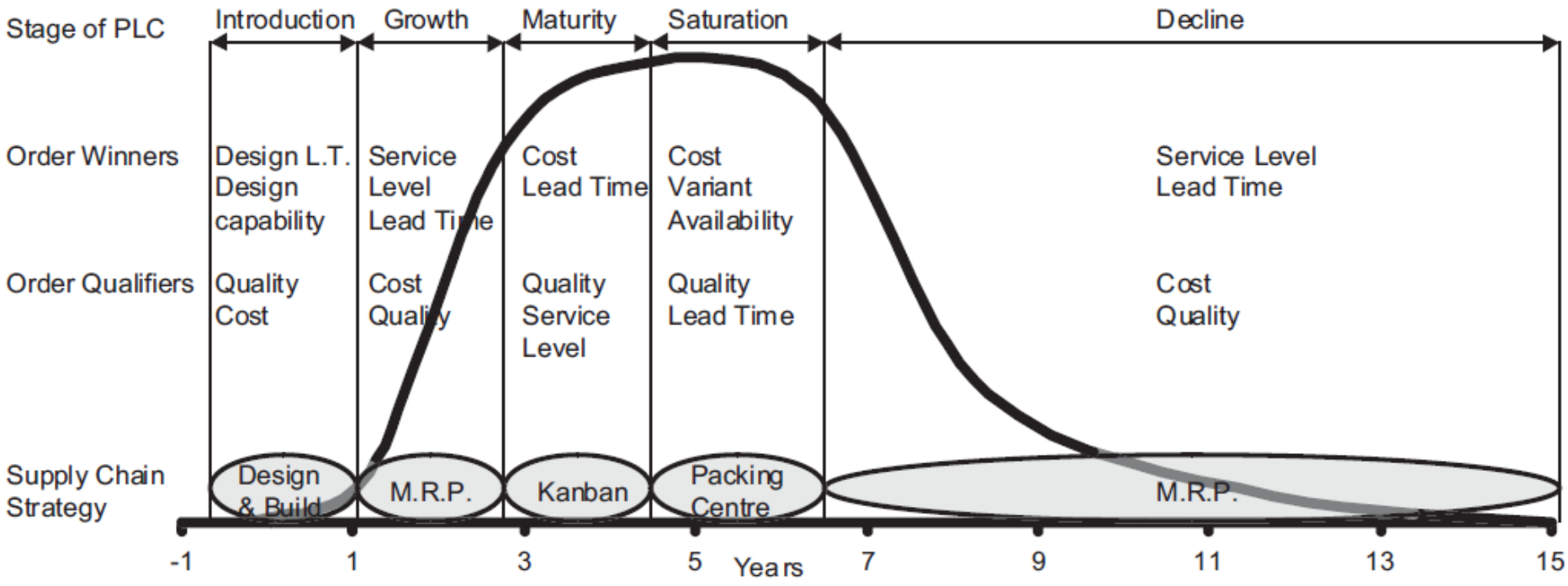
- 'outward-facing' manufacturers had the highest level of performance improvement

Harrison and New (2002)

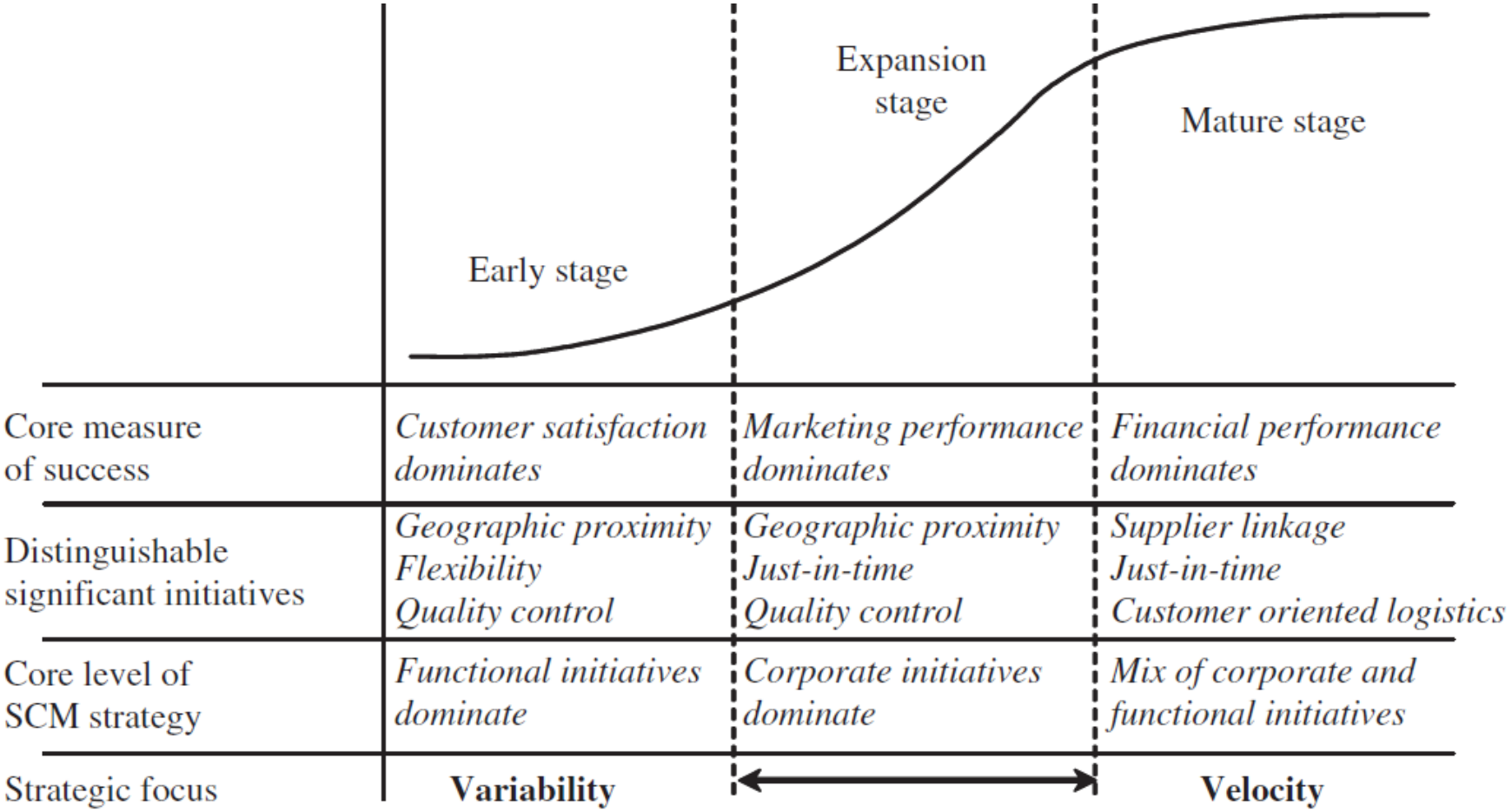
- Relied on self-reported appreciations: “How important an element is supply chain strategy to your company’s corporate strategy?”
- They found respondents that considered the supply chain strategy to be very important for their competitive advantage, and yet **had poorly defined or no supply chain strategy** at all.
- Found link between strategy and technology to be the best predictor of commitment to supply chain strategy for a competitive advantage.

Aitken et al 2003

To ‘maximize competitiveness’, supply chain strategies must be dynamically matched to the changing customer requirements **as a product proceeds through its lifecycle**.



Narasimhan et al (2008)



Cigolini et al (2004)'s matrix

		SC tools						
		Information tools			Coordination and control tools			Organisation tools
		On-line connections (EDI/Internet)	Automated identification systems	Integrated databases	SC performance metrics	SC cost accounting system	Cross-firms incentive systems	SC interfaces managers
SC techniques								
SC configuration	Design for SCM				✓	✓		
	Warehouses network redesign				✓	✓		
	Transportation fleet design				✓	✓		
	Retailing system redesign				✓	✓		
	Facilities network redesign				✓	✓		
SC management	Just-in-time	✓		✓	✓	✓		
	Logistic category management				✓			
	Group purchasing organisations					✓		
	Distribution requirements planning	✓		✓	✓			
	Transportation optimisation	✓	✓		✓	✓		✓
	Continuous replenishment and VMI	✓	✓	✓	✓	✓		✓
	Reserving upstream capacity/stock				✓			
	Re-ordering policies	✓	✓	✓				
	Business processes redesign				✓	✓	✓	

McKone-Sweet and Lee's (2009)

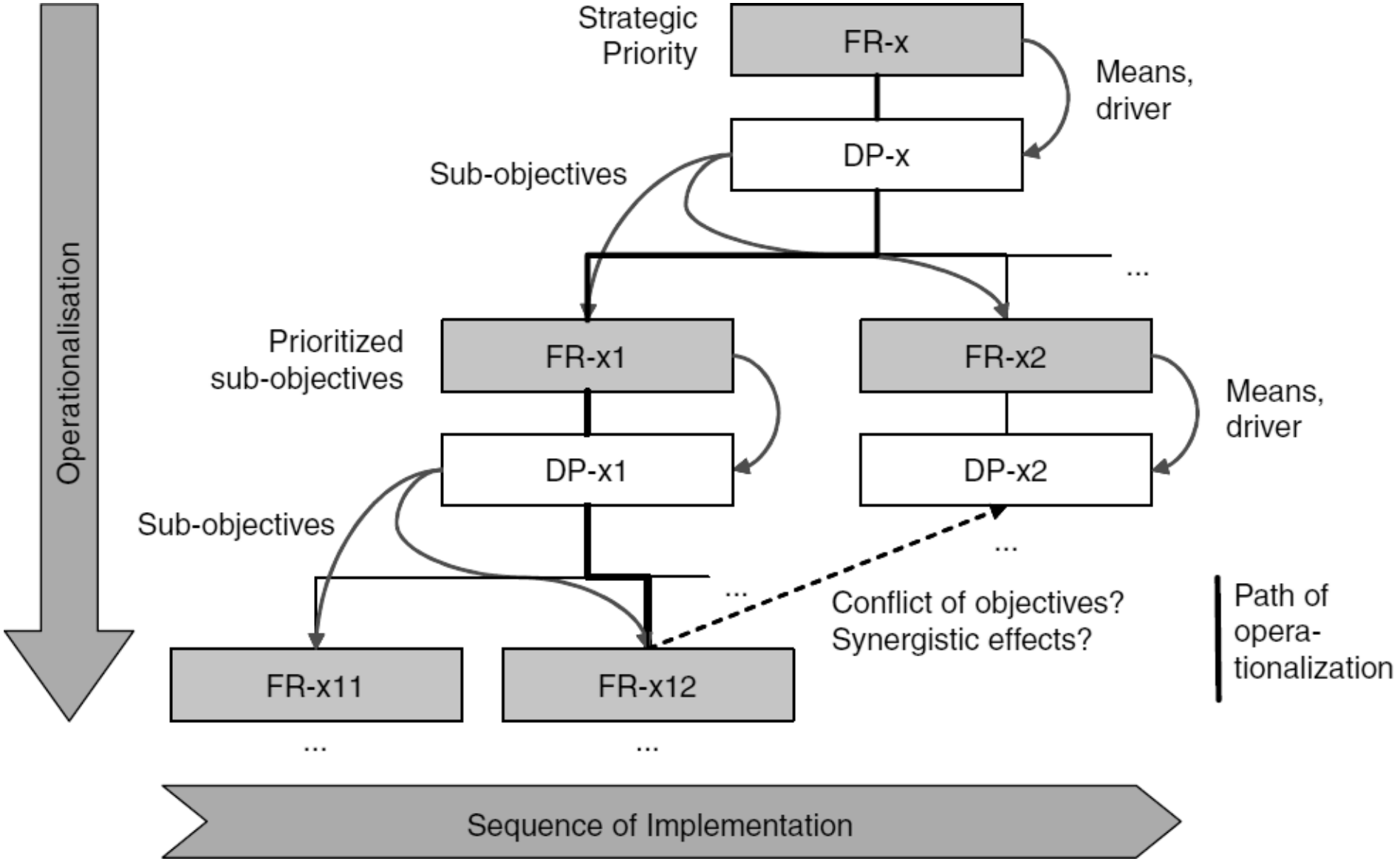
- Identified a taxonomy of supply chain strategies.
- "firms with high levels of both SC organizational and SC IT capabilities outperformed other firms"
- "firms do not yet appear to align their SC capabilities with their competitive priorities"

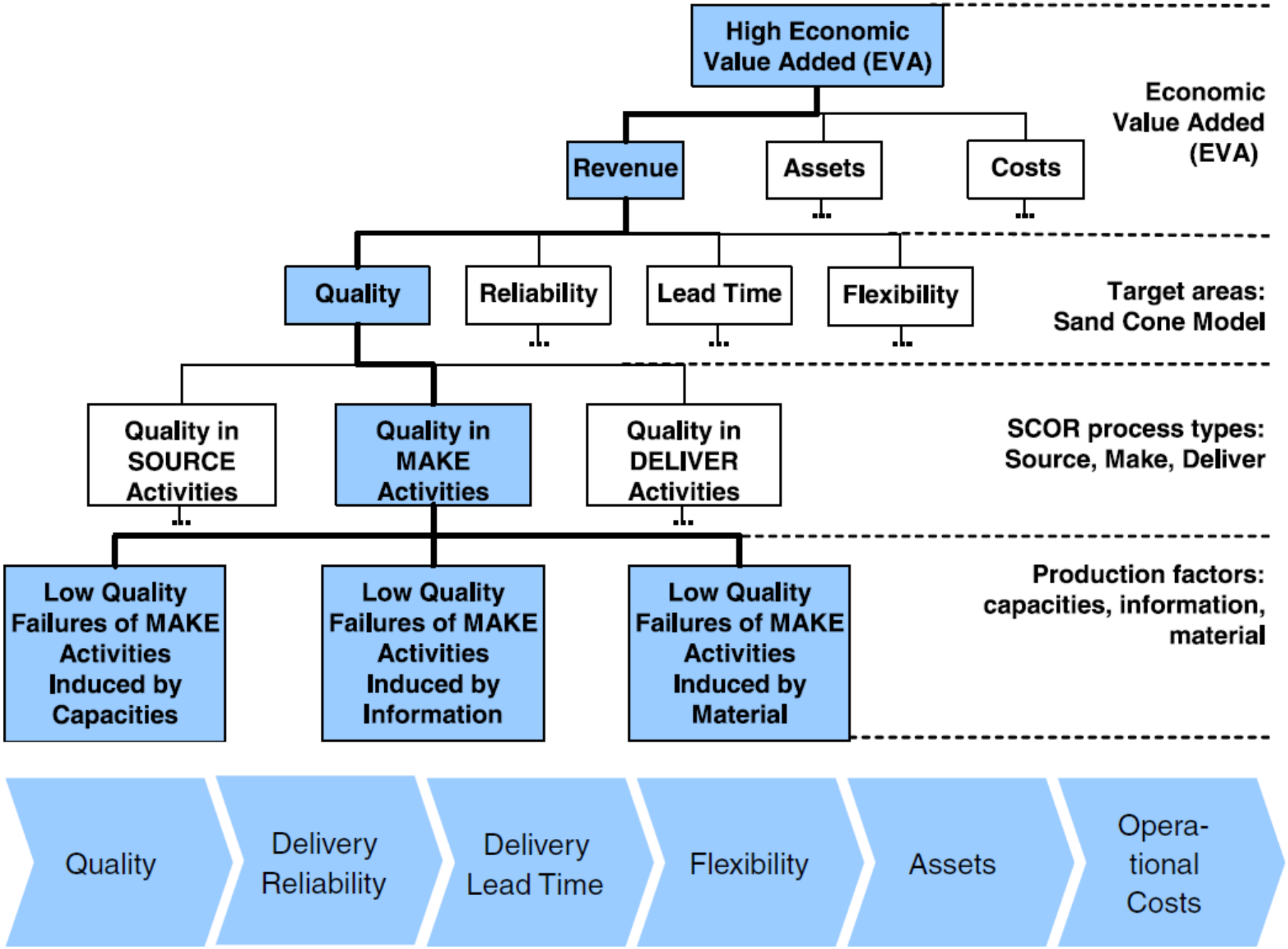
CRAFTING SUPPLY CHAIN STRATEGY: WHAT IS FOUND IN THE LITERATURE

Martinez-Olvera and Shunk (2006)

- Presumes the existence of six supply chain strategy ‘pure types’ (an unsupported claim)
- Recommends that you:
  - determine where your ‘as-is’ strategy falls in terms of a list of variables,
  - identify which of the six pure types is closest, and
  - try to migrate to that pure type
- Neither mechanism nor rationale are clear.

Schnetzler *et al.* (2007), *"A decomposition-based approach for the development of a supply chain strategy"*

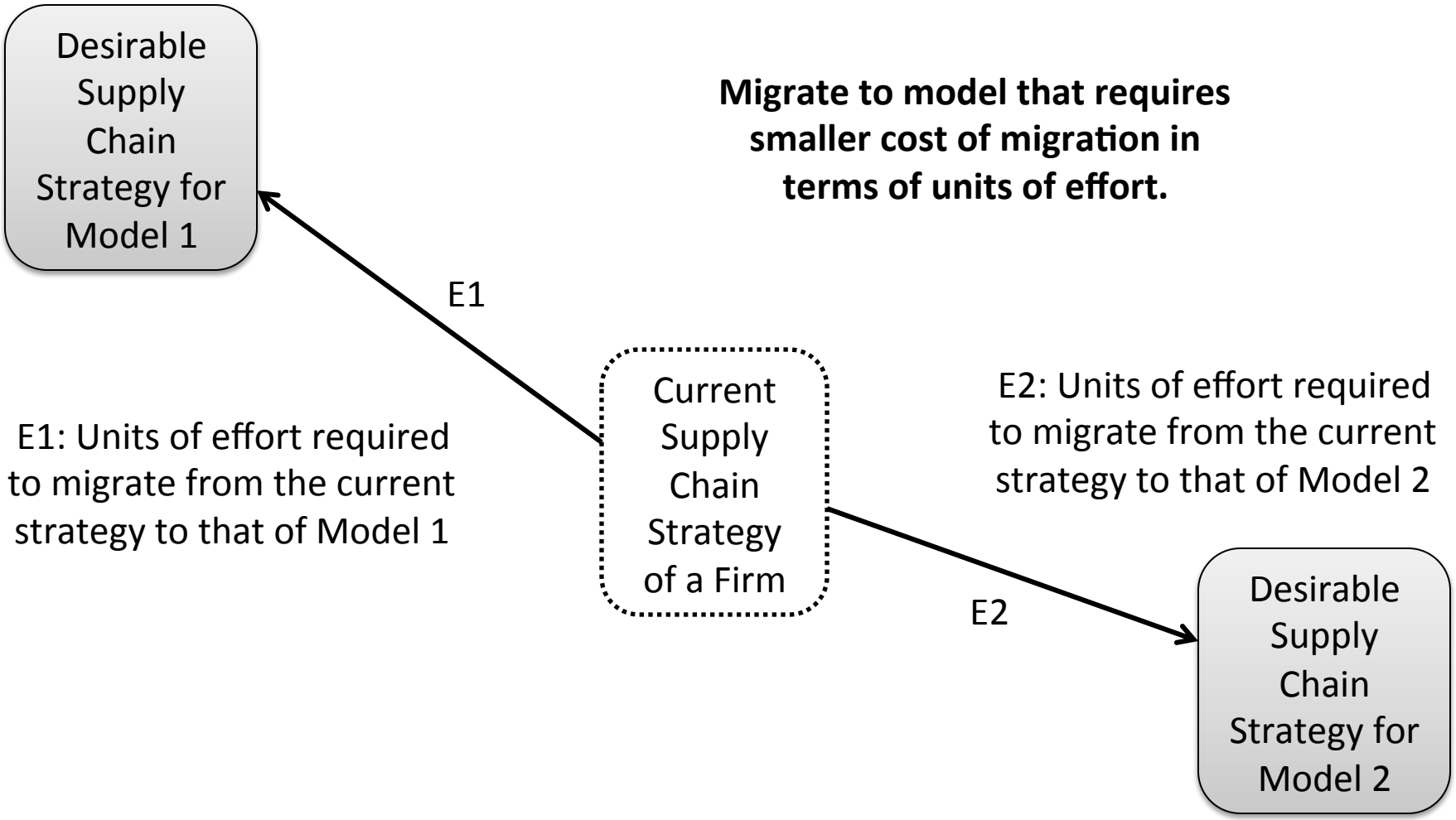



High Economic Value Added (EVA)
Economic Value Added (EVA)
Revenue
Assets
Costs
Quality
Reliability
Lead Time
Flexibility
Target areas: Sand Cone Model
Quality in SOURCE Activities
Quality in MAKE Activities
Quality in DELIVER Activities
SCOR process types: Source, Make, Deliver
Low Quality Failures of MAKE Activities Induced by Capacities
Low Quality Failures of MAKE Activities Induced by Information
Low Quality Failures of MAKE Activities Induced by Material
Production factors: capacities, information, material
Quality
Delivery Reliability
Delivery Lead Time
Flexibility
Assets
Opera-tional Costs

Schnetzler, et al. (2007)

- Asks: how can we develop a supply chain strategy that is aligned with and supporting the corporate strategy?
- Proposes using axiomatic design, a design methodology based on the principles of simplicity and independence, for the task.
- Claims to have been successful in applying the methodology to five cases.
- The methodology, however, is not clear or actionable.

Martinez-Olvera and Shunk (2006), *"Comprehensive framework for the development of a supply chain strategy"*



Hilletofth (2008, p.28)

"a differentiated SC strategy basically can be developed in the following four steps:

1. developing a segmentation model;
2. understanding the market we serve;
3. understanding the capabilities to serve the market; and
4. developing necessary SC solutions"

WHAT WE CAN TAKE AWAY

Why SCS matters

- When not understood, debated, opportunities are missed. "This tendency to exclude SCM from the strategic debate coupled with an unclear understanding of SCM strategy cause firms to **miss exploitable opportunities** to increase competitive advantage (Stevens 1990, Li et al. 2005)." Cited in Narasimhan et al (2008:3)

Alignment of SCS with the strategy

- "SCM strategies ... **should be aligned with the overall strategy** for the company as well as the entire supply chain" (Kotzab, 2003:2)
- “functional level strategies and capabilities, including SCM strategy, **should be consistent** and aligned with corporate level strategy” Narasimhan (2008:5)

Consistency with the top

- "Succinctly stated**, 'poor' consistency** between corporate level and functional level strategies **might lead to inferior** corporate performance, and 'good' consistency might lead to superior corporate performance" (Narasimhan and Carter, 1998)
- "top level management must **be involved in formulating** SCM strategies" (Kotzab 2003:2)

Cascading nature

- “SCM strategy could be viewed as part of a **hierarchical chain of strategies** ranging from corporate strategy to business unit strategy, and to functional level strategies"
- “This **cascading strategy** serves to integrate the supply chain processes with the overall direction of the enterprise and provides measures for monitoring and execution.“

Narasimhan (2008:5)

What is the objective of the SCS

- "the main objective of a supply chain strategy is to **achieve customer satisfaction** as an output of the supply chain operations" Martinez-Olvera and Shunk (2006)
- To **fulfill the business strategy**: "A firm must develop strategic objectives for managing the supply chain based on overall corporate objectives." Narasimhan (2008:5)

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