

# IPHA PRODUCTION SEMINAR 2016

October 26–27. Lleida · Mollerussa, Catalonia

## Production from client's perspective

The productivity-flexibility trade-off

Wim Jansze

IPHA



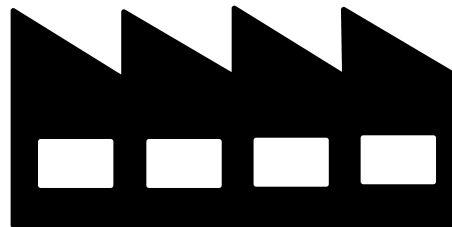
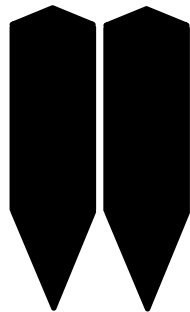
INTERNATIONAL PRESTRESSED  
HOLLOWCORE ASSOCIATION

in cooperation with

**Pujol**



## Clients. Who are they?



*"Quality requires a cost premium"*  
*"Flexibility hurts costs"*



# Clients want to have unique buildings



## BARCODE rises with HOLLOWCORE

[[www.contiga.no](http://www.contiga.no)]



## Maximo

The Fully Prefabricated Urbe Shopping Centre

[[www.maximoshopping.it](http://www.maximoshopping.it)]

[[www.generaleprefabbricatispa.com](http://www.generaleprefabbricatispa.com)]



## Innovative and versatile hollowcore in DUBAI

[[www.bpcgroup.biz](http://www.bpcgroup.biz)]



## SOUTH AFRICA

Hollowcore extends footprint

[[www.echo.co.za](http://www.echo.co.za)]



## Driving car park construction forward with hollowcore

[[www.bison.co.uk](http://www.bison.co.uk)]

But do clients want  
hollowcore ?



# Who is the client?

## 'Client' is threefold:

- A customer purchases the product
- A client is the one to be served, economically
- A consumer is the one who uses the product

**Consumer**



**Client**



**Customer**



**Supplier**





# Perspective from customer

- The customer wants low prices, good quality and on-time delivery

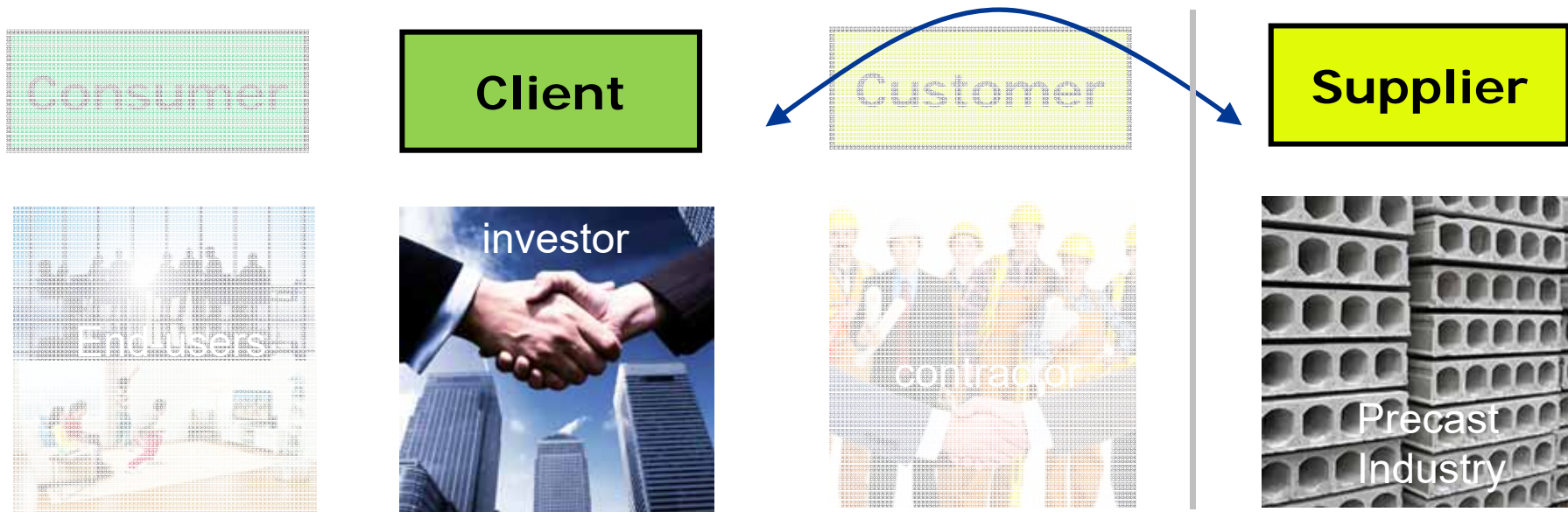
- Low costs are first gains for purchaser of contractor
- Supplier is part of logistical puzzle

→ **Cost, time and quality are key for customer**



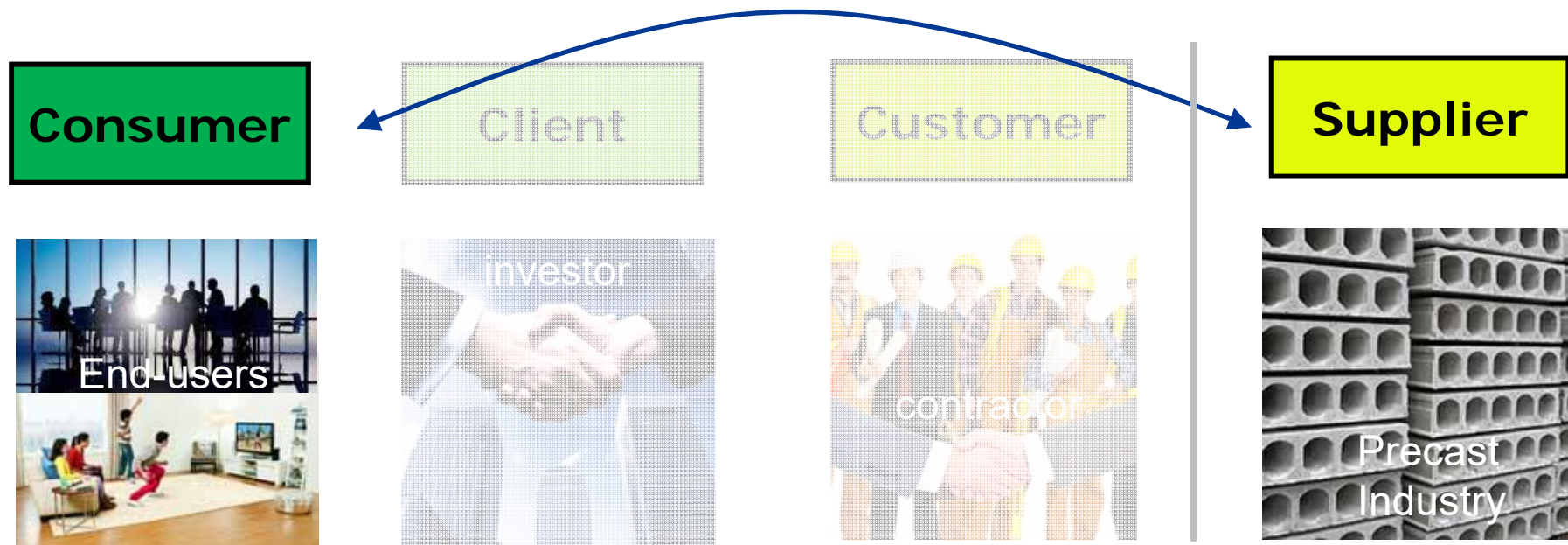
# Perspective from client

- **The client wants an unique building and high ROI:**
    - Uniqueness drives value
    - Selling it or renting it out to create returns
    - Sustainable Breeam/Leed ratings gives even higher returns
    - Change function of building in future - adaptability
- **Added-value and adaptability are key for client**



# Perspective from the consumer

- The consumer wants a comfortable building
  - "Fundamentally, customers don't want choice. They just want exactly what they want. Your job is to help them figure out what it is they want, because often they don't know - adaptable
- Comfort and adaptability are key for consumer





# Producing for the 'client' means

*Who is your client?  
What business are you in?*

- Comfort
- Adaptable

**Consumer**



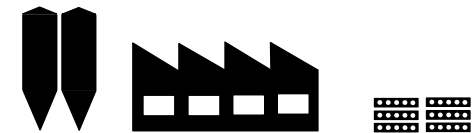
- Added-value
- Adaptability

**Client**



- Cost
- Quality
- Time

**Customer**



**Supplier**

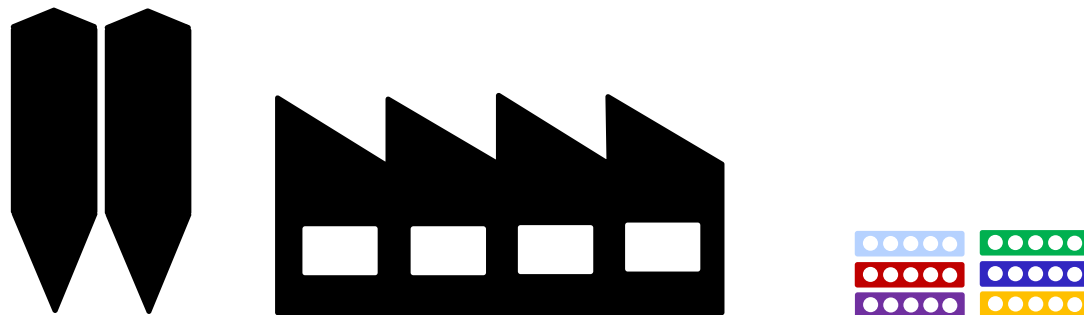




# Production from client's perspective

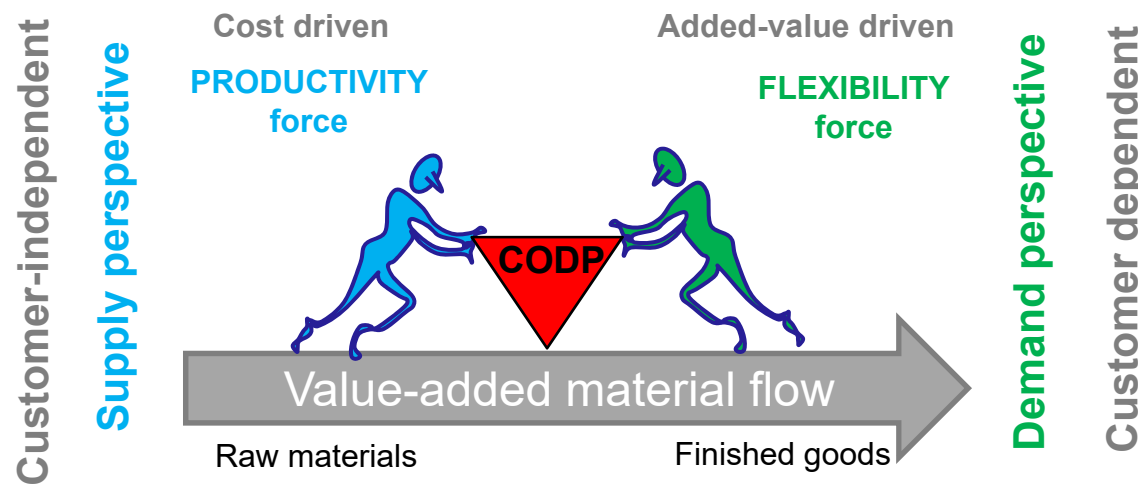
- **What is your business model in your market?**
  - Different offering (full building / sub-systems / single components)
  - Cost driven or Added-value driven
- **Factories must strive to produce the best product: more efficient, cheaper, with top quality and more variety, deliver faster with higher reliability and at to be profitable at the end**

→ Productivity-Flexibility trade-off



# The productivity-flexibility trade-off

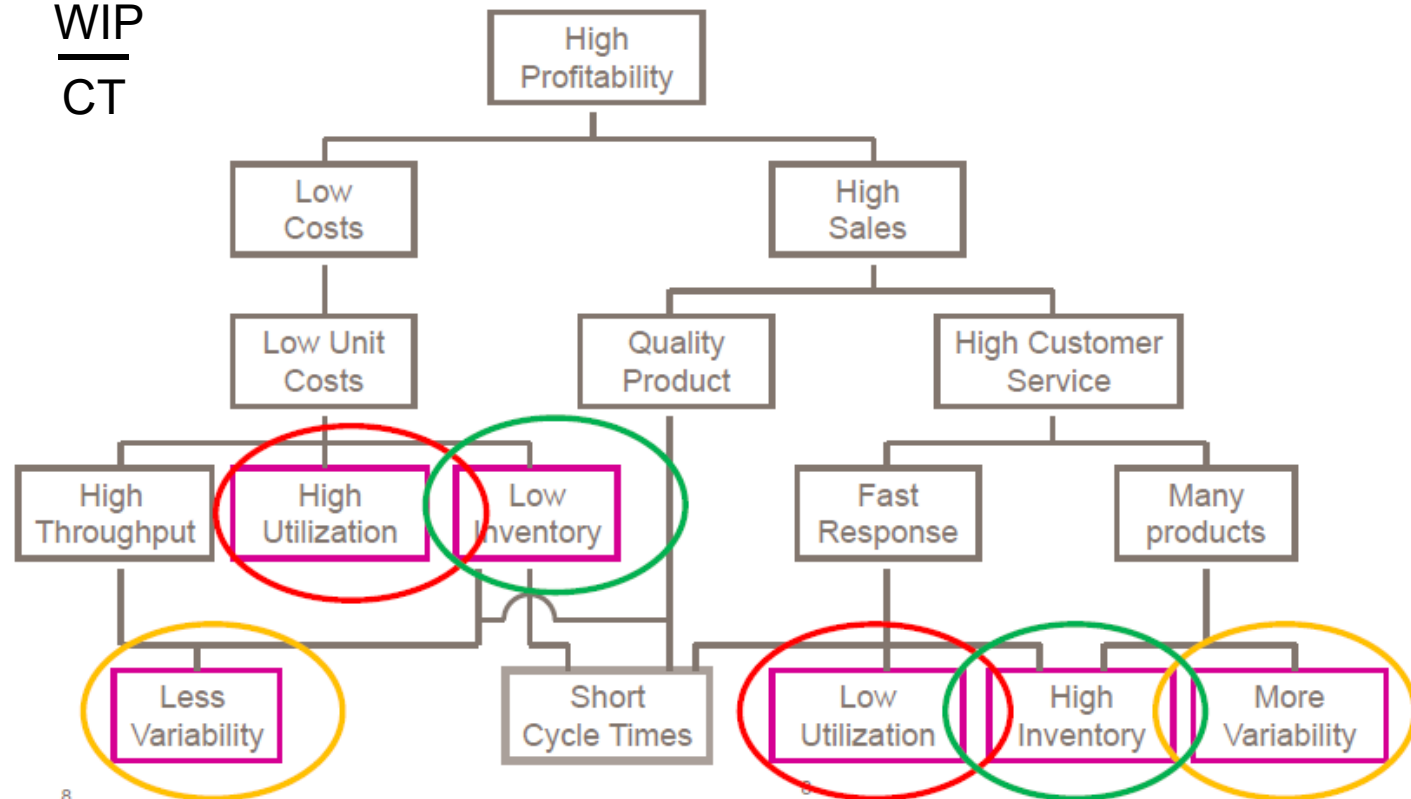
- How is the customer triggering your production activities?
- Customer Order Decoupling Point (CODP) is the fork dividing customer-dependent and customer-independent production.
- Balancing two counteracting forces:
  - Productivity force: when cost is main competitive priority, productivity pushes CODP downstream to finished goods
  - Flexibility force: when customer requirements is main competitive priority, flexibility pushes the CODP upstream to raw materials



*Rudberg and Wikner 2004*

# Business model – cost driven or added-value driven

Little's law:  $TH = \frac{WIP}{CT}$



TH = Throughput: average quantity of *good* (non-defective) parts produced per unit time.

WIP = Work in Process: inventory between the start and endpoints of a product routing.

CT = Cycle Time: time between release of the job at the beginning of the routing until it reaches an inventory point at the end of the routing.

# The productivity-flexibility trade-off

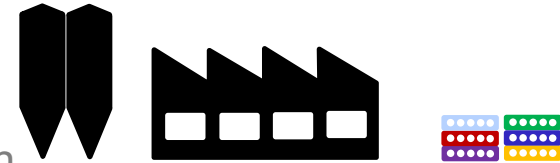
Productivity	Competitive advantage	Reasons for productivity	Negative effects
	<ul style="list-style-type: none"> <li>• Price</li> <li>• Delivery speed</li> <li>• Delivery reliability</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce customer lead time</li> <li>• Process optimisation</li> <li>• improved manufacturing efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Rely more on forecasts</li> <li>• Reduce product customization</li> <li>• Increase WIP</li> </ul>
Flexibility	Competitive advantage	Reasons for flexibility	Negative effects
	<ul style="list-style-type: none"> <li>• Product range</li> <li>• Product mix flexibility</li> <li>• Quality</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing degree of product customisation</li> <li>• Reduce the reliance on forecasts</li> <li>• Reduce or eliminate WIP buffers</li> </ul>	<ul style="list-style-type: none"> <li>• Longer delivery times</li> <li>• Reduced delivery reliability</li> <li>• Reduced manufacturing efficiency</li> </ul>



# Measuring manufacturing performance

- **Firm's manufacturing strategy:**

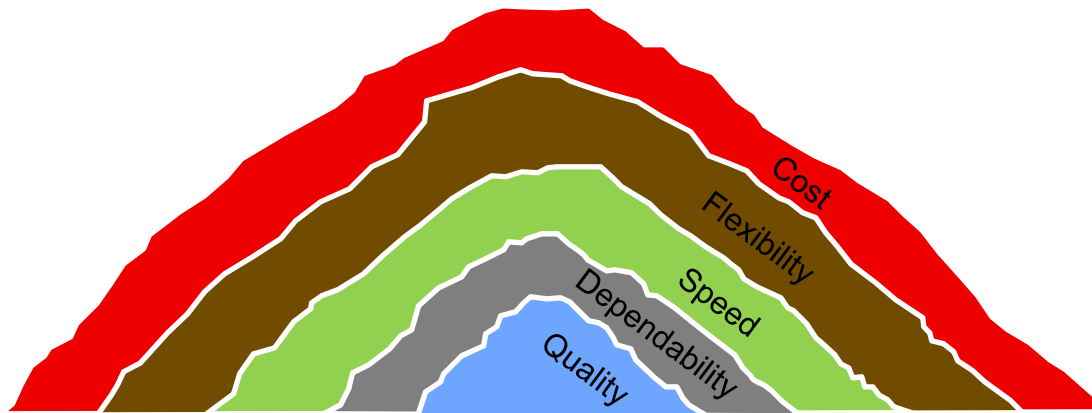
- Hardware – structural decision components
  - Capacity, location, technology, vertical integration
- Software – infrastructural decision components
  - HRM, quality control, production planning, inventory control, information management, performance management, organizational structure



- **Manufacturing performance measured by 5 competitive priorities:**

1. Quality
2. Dependability
3. Speed
4. Flexibility
5. Cost

# How to become agile?



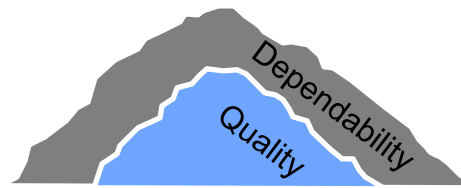
- The sand cone model theory argues that firms can overcome tradeoffs associated with the development of multiple capabilities if they build these capabilities according to a precise sequence.

## 5 competitive priorities manufacturing performance



- Quality is an important competitive priority – visual and technical quality

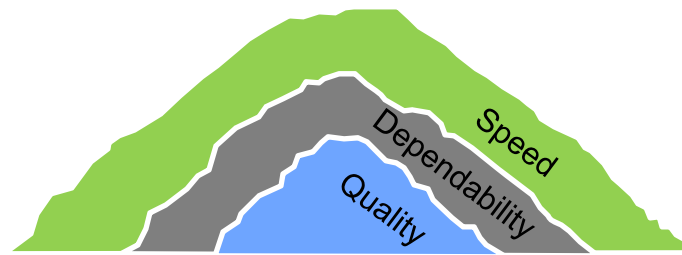
## 5 competitive priorities manufacturing performance



- Quality is an important competitive priority – visual and technical quality
- Dependability = Deliver the right goods in the right quantity in right time

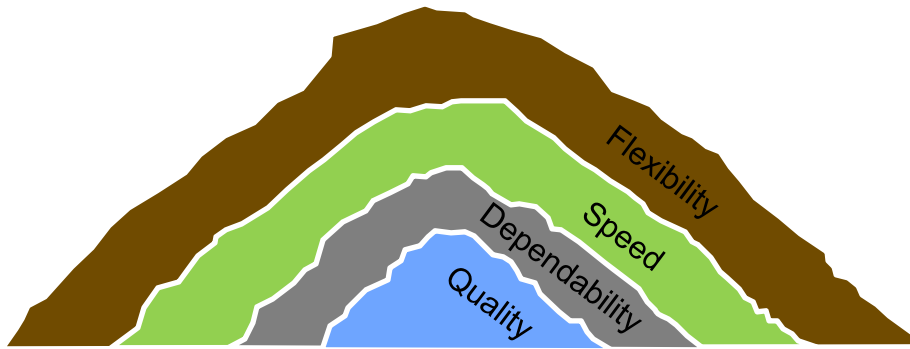


## 5 competitive priorities manufacturing performance



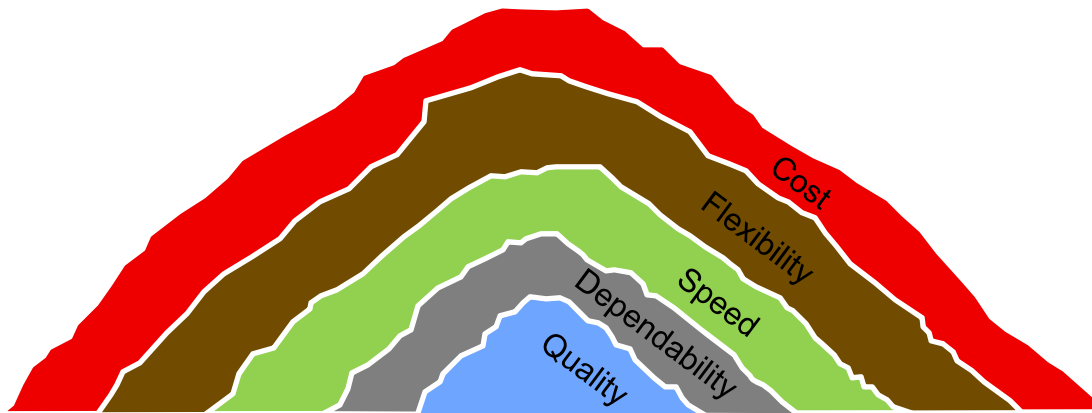
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## 5 competitive priorities manufacturing performance



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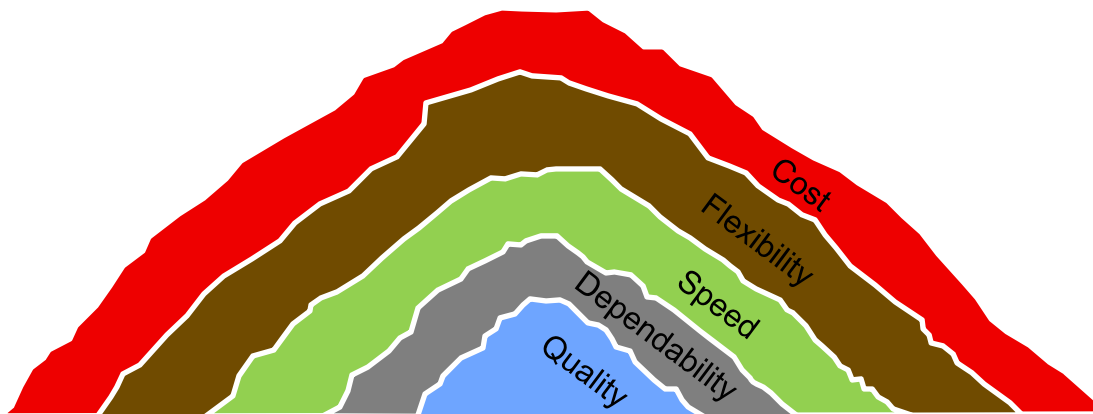


Sandcone model  
Ferdows, K. and A. De Meyer, 1990)

- Quality is an important competitive priority – visual and technical quality
- Dependability = Deliver the right goods in the right quantity in right time
- Speed = Ability to introduce new models in production faster than competition
- Flexibility = output flexibility in product mix or volume
- Cost = all things equal, customers prefer lower costs to higher costs

# How to become agile?

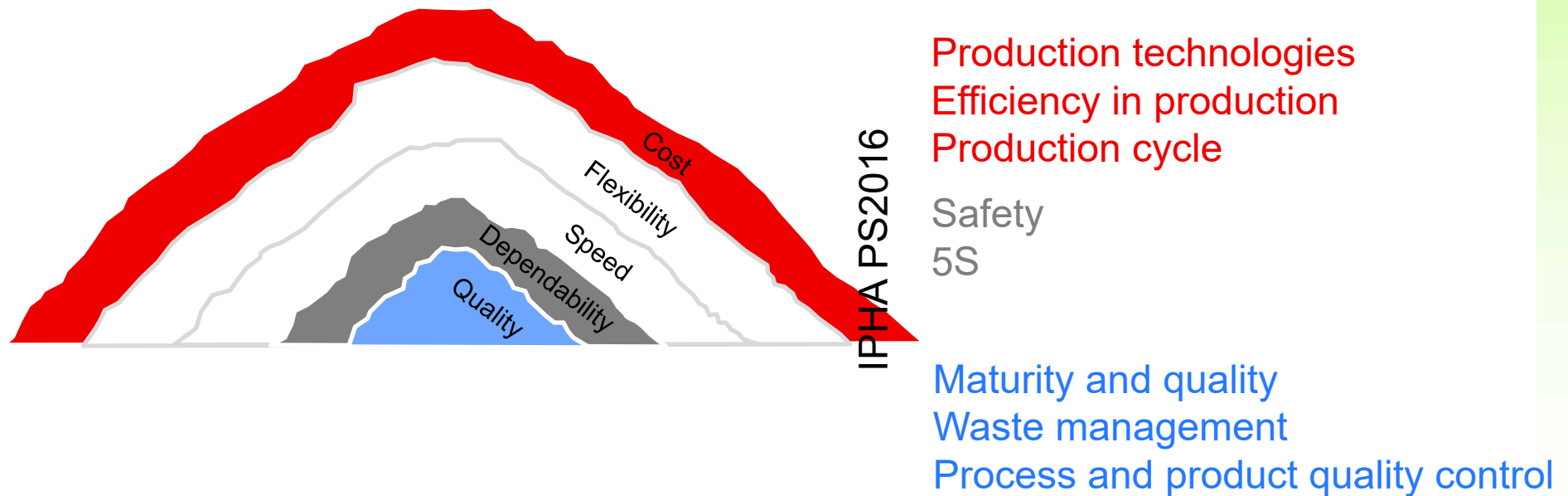
- The sand cone model theory argues that firms can overcome tradeoffs associated with the development of multiple capabilities if they build these capabilities according to a precise sequence.
- Based on the Sand Cone Model, firms following the special sequence will perform better than those not following the sequence because it is less efficient and therefore cost more for those that do not follow the sequence to accumulate all five capabilities





## IPHA's 2016 production seminar focus

- The sand cone model theory argues that firms can overcome tradeoffs associated with the development of multiple capabilities if they build these capabilities according to a precise sequence.
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# Mass customization

- Standardization and economies of scale were the magic words in earlier times.
- Now, the economic order quantity has been reduced to one, in fact one almost never produces the exact product twice.



- Mass customization relates to the ability to provide customized products through flexible processes in high volumes and at reasonably low costs through high process agility, flexibility and integration

# No trade-off productivity-flexibility

- Development of mass customization systems is based on three main ideas:
  - First, new flexible manufacturing and information technologies enable production systems to deliver higher variety at lower cost.
  - Second, there is an increasing demand for product variety and customization.
  - Finally, the shortening of product life cycles and expanding industrial competition has led to the breakdown of many mass industries, increasing the need for production strategies focused on individual customers.
- Be productive at low costs: more focus on speed and flexibility

